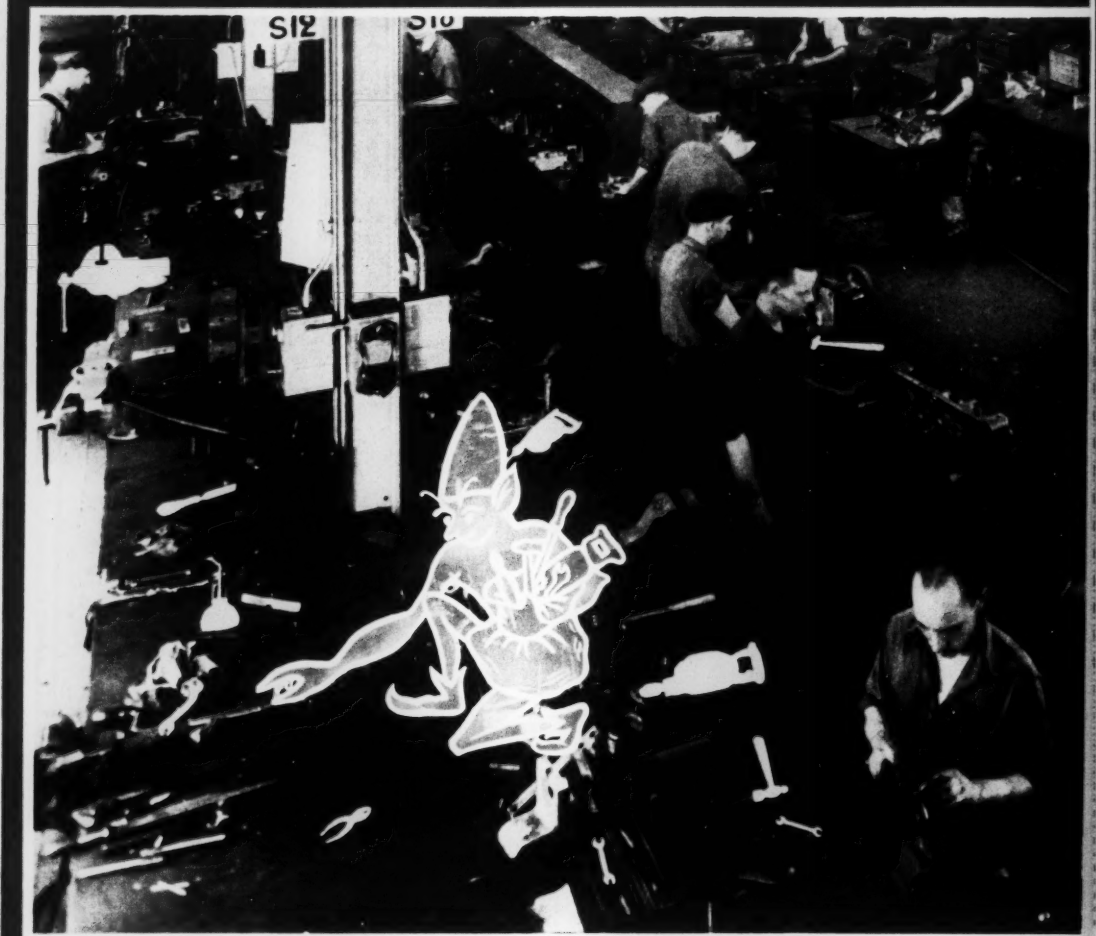
OCTOBER 20, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



MANAGEMENT CLINIC:

Readers Tell How To Solve The Missing Tool Problem

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STEEL BUYING SPREE FOR AUTOS
CMP Gets Out of Joint, p. 61

SAVE METAL TREATMENT SOLUTIONS
Ion Exchange Is the Answer, p. 96

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take a

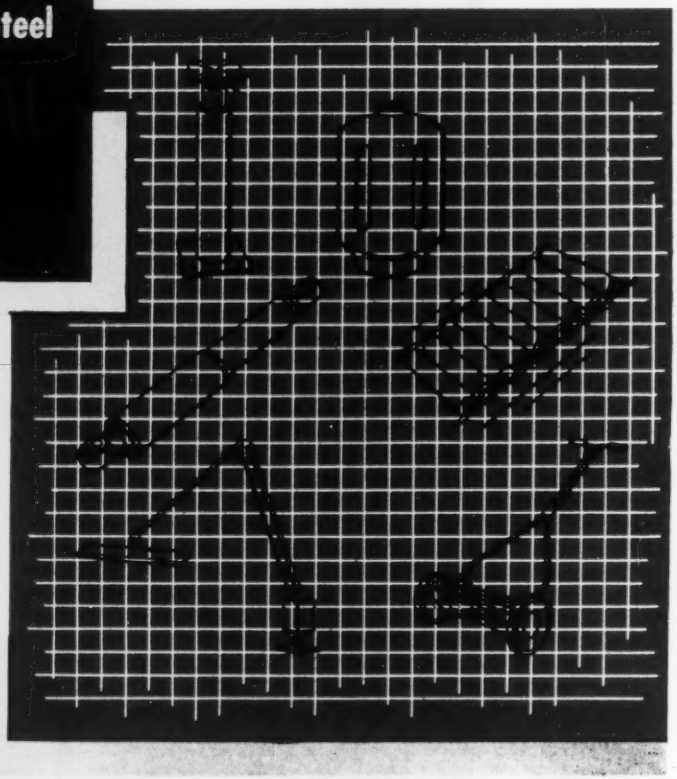
CLOSER LOOK

at

B&W ERW Carbon Steel MECHANICAL TUBING

to

- . . . Simplify Product Design
- . . . Improve Appearance
- . . . Reduce Scrap Loss
- . . . Speed Fabrication
- . . . Save Final Finishing Time
- . . . Secure Maximum Economies
- . . . Obtain Higher Strength to Weight Ratio



B&W ERW tubes are made on the same **modern** mills (and by the same skilled craftsmen) that produce B&W welded pressure tubes which have for many years met the exacting requirements of boilers and other heat transfer apparatus. This inherent standard of excellence assures you the finest welded tubing to make hollow structural and machined parts. Write for Bulletin TB 333, a thrifty little booklet filled with cost-saving details. Or call in Mr. Tubes, your B&W Tube Representative, to help you match tubing economies and production efficiency.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

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B&W SEAMLESS and WELDED TUBES

TA-1689M

They're So Easy to Machine!

For a circular steel blank, the machine shop is the first real test. Can it be rough cut easily? Finished up smoothly and fast? Or will it cause the machinist all sorts of trouble?

Naturally, much depends on what's inside the blank. If it's a Bethlehem circular forging, it's solid metal all the way through. Your machinist will always be cutting in firm, homogeneous steel. No danger of running into flaws after costly preliminary cuts have been taken.

You might ask, "How can we be sure? How are these blanks different from any others?"

First of all, they're made from steel selected with extra care. Second, they're made by a special, exclusive process that forges the steel and rolls it too – thereby insuring compactness of metal, uniform density, and just the right grain structure.

Use these blanks in making gears, crane and sheave wheels, brake wheels, tire molds, turbine rotors, flywheels, and many other heavy duty products. They range in size from approximately 10 to 42 in. OD, and are available untreated or heat-treated. Booklet 216, sent free upon request, will give you the full story.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-AND-FORGED CIRCULAR PRODUCTS

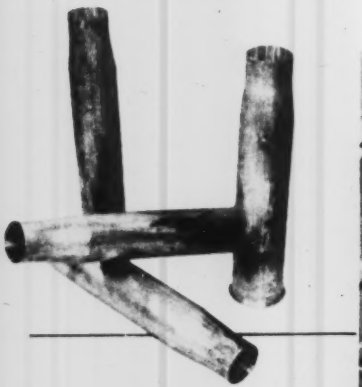
Here's How Heald precision solved a vital ordnance problem

The successful salvage of used artillery shells calls for a high degree of accuracy and precision in the re-boring operation. Speed is important, too—to maintain high rates of production and keep salvage costs to the minimum.

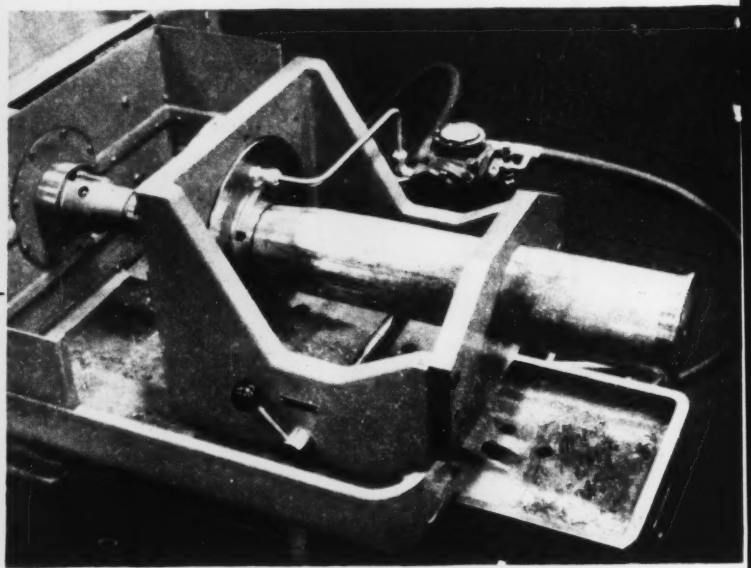
These exacting requirements were easily met with the Heald Model 121 Bore-Matic shown below—arranged for re-borizing 90 mm shell cases. The work is held in a single-station angle-type fixture with a quick-acting air-operated collet chuck. Table is started left at rapid traverse, slows to bore, then reverses at rapid traverse. A retractable boring bar eliminates tool drag line during outstroke. Bar automatically rests to boring position when table reaches rest position.

Remember—when it comes to precision finishing, it pays to come to Heald.

Re-borizing on a Heald Model 121 Bore-Matic makes used 90 mm shells as good as new



Heald Model 121 Bore-Matic, arranged for fast, precision re-boring of 90 mm artillery shell cases.



HEALD

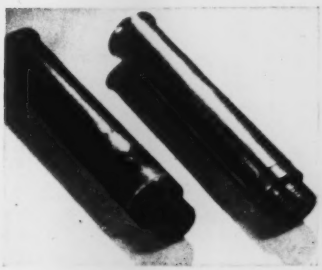
Heald precision speeds the nation's production

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

"CENTERLESS BRUSHING" speeds the production of fine finishes for cylindrical parts such as this compressor piston. One user of this Osborn-developed method gets micro-smooth finishes at outputs as high as 10,000 pistons per 8 hours. Can be applied to many sizes of parts and types of material.



CLEANS SCALE. Heat treat scale on the tube at the left is removed by Osborn power brushing. Result, shown at right, is perfectly clean surface, ready for painting. Have an **OBA** study your product cleaning operations to find ways to cut their cost.

Why 400? Deburr 1400 per hour!

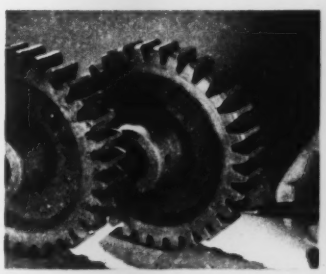
Here's how a manufacturer of brass components for ammunition has stepped up production with Osborn Power Brushing:

In the removal of feather burrs from threads and the machined surface of these brass parts, former output was 400 per hour. With the help of the **O**sborn **B**rushing **A**nalyst, this company designed the brushing machine shown. The parts are placed on spindles of a rotating table. As they pass the Osborn Monitor Brush, they rotate and expose the entire face uniformly to the brush. Parts come clean and smooth . . . at a rate of 1400 per hour! And in another machine, Osborn Brushes deburr the internal threads of this part . . . smooth and fast!

Have the **OBA** show you production-boosting ideas for your shop! Call today or write, *The Osborn Manufacturing Company, Dept. 837, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



FASTER DEBURRING. Here's another "before and after" example of gear deburring with the Osborn Work Holder Brushing Lathe. Burrs and sharp edges are removed uniformly. Production increases of 20% to 1570% are being reported by users.

SEE YOU AT METAL SHOW

Let us discuss your brushing problem at Osborn Booth 729.

FOR PRECISION IN VOLUME JET BLADE PRODUCTION . . .

EX-CELL-O

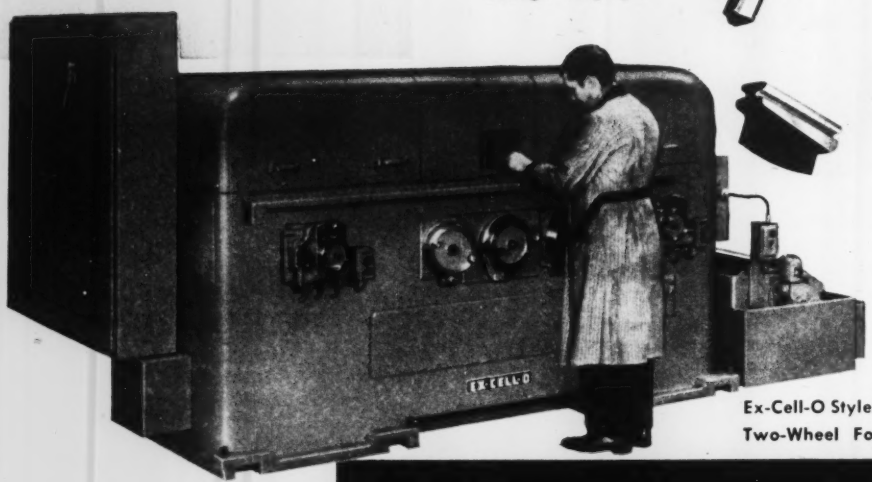
MACHINE GRINDS ROOTS OF JET BLADES AND BUCKETS

With this production-proved Style 85 Precision Two-Wheel Form Grinder both sides of the root forms of jet blades and buckets can be ground simultaneously. Automatic features permit unskilled operators to do the work quickly and accurately.

Wheel dressing and size compensation, work reciprocation, wheel feed and retraction, coolant control, unclamping, and lubrication—all these functions are automatic. Operator has only to load, unload, and press clamp and start cycle buttons.

For precision in volume jet blade production, install the "Ex-Cell-O Package" of jet blade finishing machines, including Style 86 Profile Miller, Style 87 Profile Grinder and Style 88 Profile Polisher. Write, wire, or phone Ex-Cell-O in Detroit or contact your local Ex-Cell-O representative today. Ask for Bulletin 50719.

Dovetail and pinetree forms are ground automatically from rough forgings.



Ex-Cell-O Style 85 Precision Two-Wheel Form Grinder.

EX-CELL-O CORPORATION

XLO

EX-CELL-O for PRECISION

This Week in Metalworking

STEEL

Vol. 131 No. 16 Oct. 20, 1952

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EXCELLO for PRECISION

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BRAZING ALLOYS

DEPENDABLE ALLIES in cutting Metal Joining Costs

SIL-BOND
WIRE
Excellent silver alloy ... for the STEELS & IRONS ... melts at 1120 F, brazes at 1145 F. Use SIL-FLUX

PHOSON
RODS
6% silver ... for BRONZES & BRASSES ... melts at 1185 F, brazes at 1380 F ... Low Cost. Use SIL-FLUX

PHOSCO
POWDER
No Silver ... for the Coppers ... self-fluxing ... melts at 1300 F, brazes at 1495 F ... Very Low Cost.

RINGS
SAVE 6 WAYS
Any ring and wire size ... any alloy ... any quantity ... Low Cost.

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Made to a new better chemical formula ... 7 definite advantages, all mean better brazing.

For complete information ask your WELDING SUPPLY DISTRIBUTOR or our nearest office

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Behind the Scenes...

Disappearing Pachyderms

We're told that one of the exhibitors at the Iron and Steel Show had some miniature elephants and donkeys to pass out as lapel pins. Demand for the elephants was so great that the whole supply was gone after the show was three days old. The jackasses lasted through the whole show.

The guy who told us about this had some important conclusion to draw but we're hanged if we can remember what it was.

Slight Error

A letter came in one day last week addressed as follows:

Look Magazine
Att: Irwin H. Such, Ed
Penton Bldg
1213 W. 3rd St
Cleveland 13, Ohio

Inside it says, "Do you have to rely on over-the-back-fence methods to find out what is said about you and your company on radio and TV?"

"The town gossip has her place, but you can't run a business on here-say evidence."

You know they're right. The service offered is one of monitoring radio and TV programs and then sending you verbatim transcripts of what is said about you and your company. The first thing we have to see is that they call us STEEL.

Poetry

Here's a poem that was written by Geraldine, our cleaning lady and night editor. She says that when she wrote it she was thinking of General Ike. Since she's still in mourning for the Brooklyn Dodgers, however, she wants it dedicated to them too.

It's kind of amazing to see
How much lauded one man can be
Till back from the wars
Your own gang he ignores,
And then he's a bum, isn't he?

We didn't know she could write poetry. As a matter of fact we're still not sure!

Plenty to Do

We searched the ads in the Oct. 6th issue of STEEL and found that 53 of them (don't count 'em—we did) make a direct offer to send a booklet, pamphlet, chart, catalog, leaflet, brochure, folder, data sheet, literature, list, etc., ad almost infinitum—all free. We can use STEEL like a library.

Also countless offers to answer questions, cite illustrations, send samples, give help and interview for a job promise many happy hours for us. Some of these offers will be handled by mail, but a few, which should be saved for the lonely evenings, are invitations for personal phone calls.

Sorry Ladies

We had a letter the other day from the Meadville, Pa., business women's club. They point out that we twice mentioned the date of National Business Women's Week—and both times we were wrong.

It's a little hard to understand because we always try to keep in close touch with business women. Anyhow we bow our heads in shame and apologize for the error.

So all you girls who took your dogs for a walk as we suggested, in the Sept. 22nd issue, can take your sweaters off, send the dog home and get back to work.

Puzzle Corner

We don't like to say we told you so, but we did. The spider problem in the Oct. 6th issue was a fooler. At the time of this writing we have correct answers from only two people. They are Leonard C. Grimshaw, Firth Sterling Steel & Carbide Corp. and Omar Goode, Ohio State University. Solution is 46.5 (plus) feet. Method is to unfold the room into a flat surface. Distance then is the hypotenuse of a right triangle having two legs, one 42 and the other 20 feet long.

This week's puzzle has two answers. See if you can get both of them. The sum of the square and the cube of a number is twice the number. Find the number (s).

Shrdlu

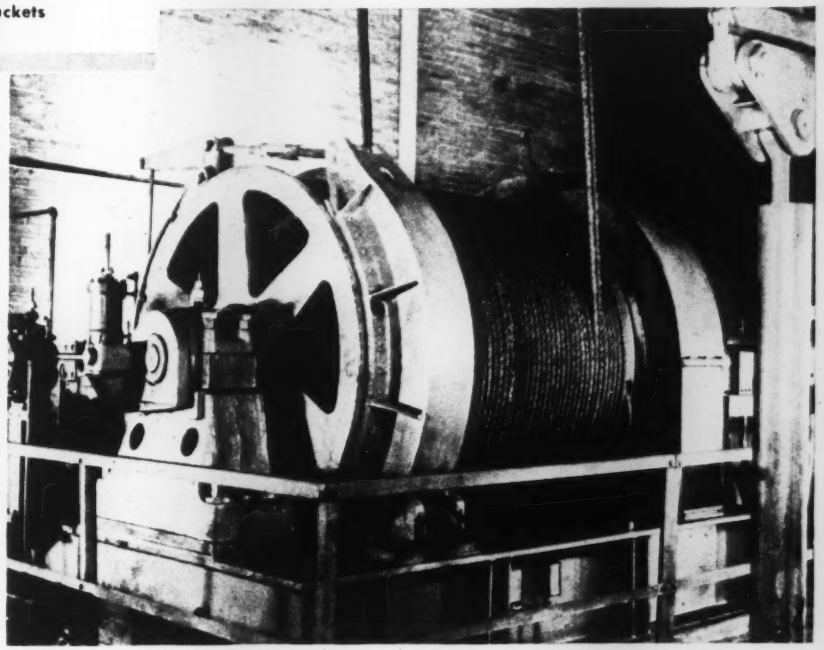
(Metalworking Outlook—Page 53)

Wellman will build it

Special Cranes
Skip Hoists
Ore Unloaders
Charging Machines
Forging Manipulators
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Ore and Coal Bridges
Clamshell Buckets

Wellman skip hoists

Speed blast furnace materials handling



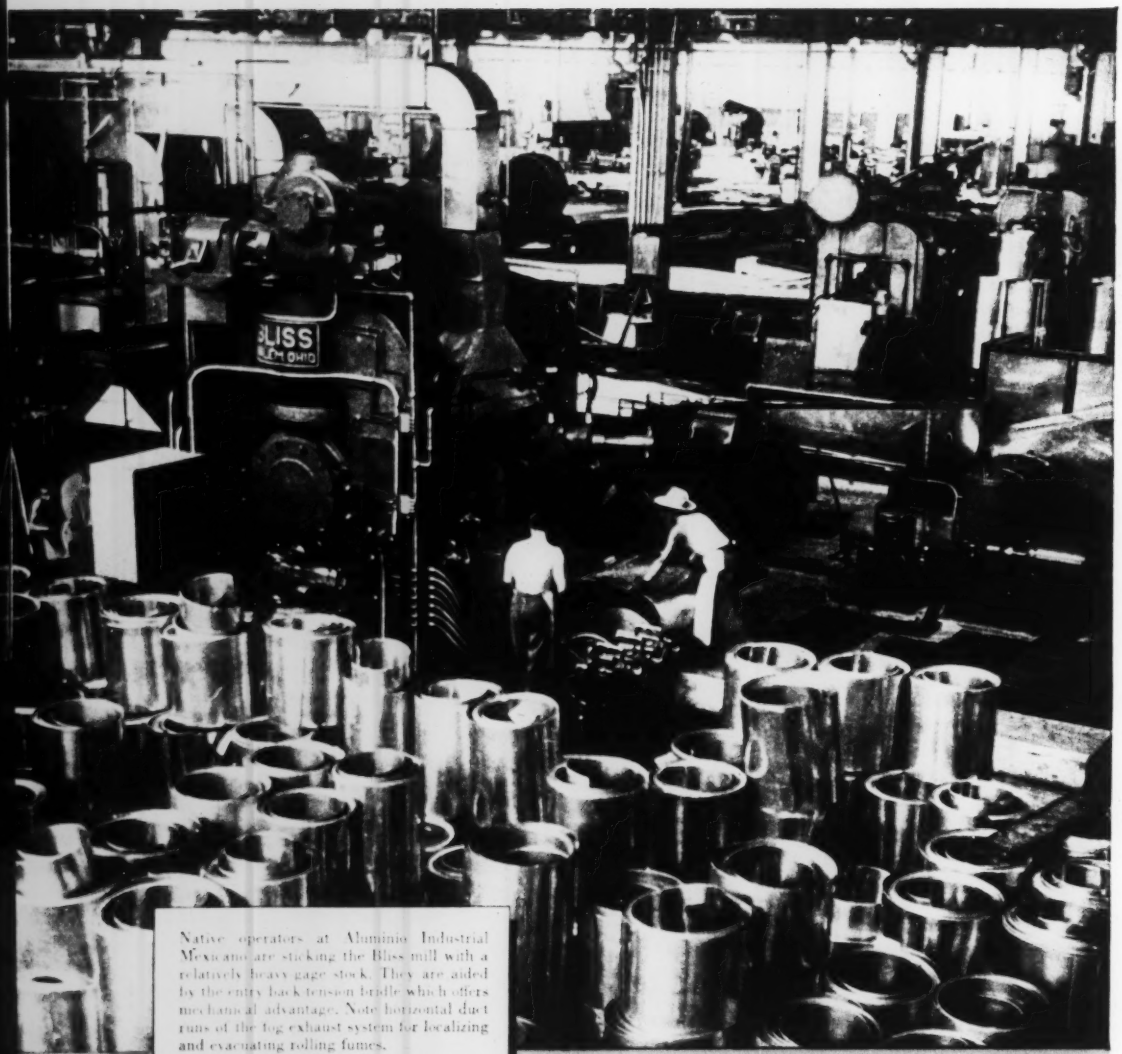
Wellman 6-ft., Single Drum Blast Furnace Skip Hoist.

● Wellman Skip Hoists are recognized throughout the steel industry for their smooth, reliable operation. They incorporate design advancements and engineering recommendations based on many years of proved performance. Wellman equipment for steel mills is backed by more than half a century of experience in designing and building for economical service.

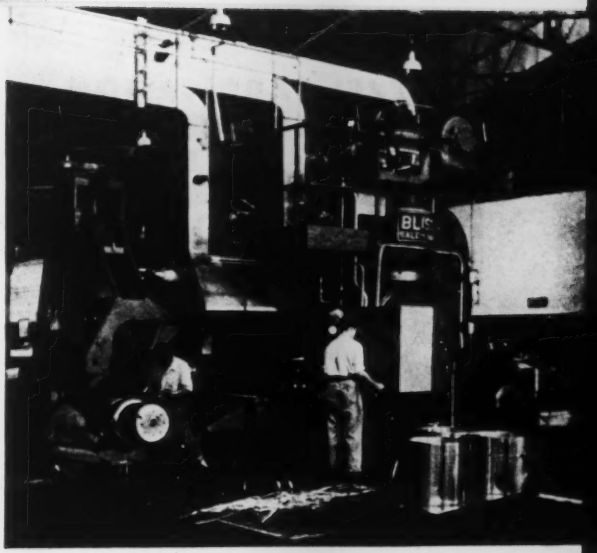
THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

Mexico's First 4-High



Native operators at Aluminio Industrial Mexicana are sticking the Bliss mill with a relatively heavy gage stock. They are aided by the entry back-tension bridle which offers mechanical advantage. Note horizontal duct runs of the fog exhaust system for localizing and evacuating rolling fumes.



Heavy gage coil is banded to prevent unwinding. Mill was designed to accommodate heavy and light gages of aluminum alloys.

Mill Is Bliss Built

When Aluminio Industrial Mexicano, S. A., put its new four-high mill through its paces, it marked another success for Bliss rolling mill engineers. For Bliss created this versatile production unit, custom designed it for heavy and light gage rolling, and operation maintenance by native employees.

Built for both intermediate and finish rolling of aluminum alloy coiled sheet stock, the mill is equipped to give reductions up to 50% at speeds to 350 spm. Starting gage 0.100" is generally run down to 0.019" in 40" widths. Complete installation includes pay-off reel, entry tension bridle, belt wrapper and tension reel rewind with unloader.

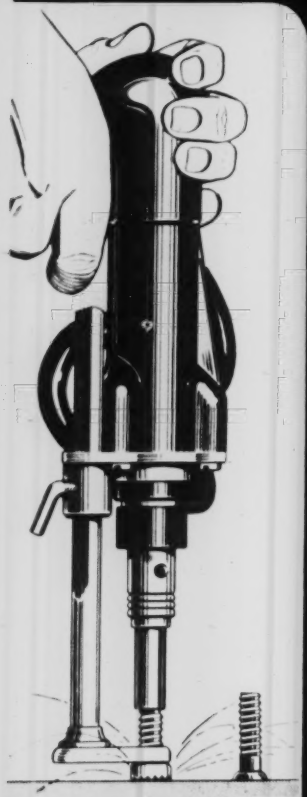
Plant officials at Aluminio report full satisfaction with the Bliss mill, the first four-high to be installed in Mexico. They find the motorized roll changer for back-up rolls "fast and convenient"...say "the unit is well tailored for local considerations... atmospheric conditions, altitude...operation and maintenance by locally-trained personnel."

You will find similar Bliss case histories in major steel, aluminum and brass mills everywhere. Whether it's a multiple-stand tandem hot mill or an important accessory machine, Bliss engineers are interested in working with you. A good idea of the experience you draw on can be seen in Bliss' new 52-page Rolling Mill Brochure. Write for your copy today.

E. W. BLISS COMPANY, CANTON, OHIO
ROLLING MILL DIVISION: SALEM, OHIO
E. W. Bliss (England), Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

IN STEEL FABRICATION...

HERE'S HOW NELWELD SPEEDS PRODUCTION



AN ELECTRIC ARC WELDING PROCESS

END-WELDS STUDS TO STEEL IN A SPLIT-SECOND

ELIMINATES DRILLING, TAPPING, HAND WELDING

REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK

NELWELD

SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES

IMPROVES PRODUCT DESIGN AND QUALITY

A NELWELD CLINIC CAN SHOW YOU—

right in your own plant, how you can benefit from this modern fastening method.

Write today for the Nelweld Clinic brochure to Lorain, Ohio.

Fasten it Better...at Less Cost with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

LETTERS TO THE EDITORS

Editorial Proves Prophetic

Your editorial "The Real Threat" (Oct. 6, p. 43) prompts me to write this note.

This article strikes me as most interesting at this moment with reference to the opportunity of smaller-sized companies, which includes ours. We have been exceptionally busy producing heavy machinery for the steel expansion program. We have taken the view that the expanded steel production would have to be 'worked-up' into lighter producing machinery and in the end, consumer goods. Even though we did anticipate these possibilities, it is surprising the amount of activity that is currently being generated in this field, and I wanted you to know that your forecast is actually being confirmed.

H. D. Miller
president
McKay Machine Co.
Youngstown, O.

Recuperators by Loftus

We request that you correct an erroneous statement in your story on the Fairless Works (STEEL, Sept. 22). The controversial copy is on page 135 where you say: "The twenty pits are arranged in pairs, are of Loftus design with Amsler-Morton recuperators."

The patents on this type of recuperator belong to W. A. Morton, vice president of Loftus Engineering Corp. You can call them Morton recuperators or Loftus recuperators. They are not connected to the Amsler-Morton Co. in any way.

Charles T. McClelland
Loftus Engineering Corp.
Pittsburgh

• *Loftus recuperators it shall be.—ED.*

Aid to Steel Imports

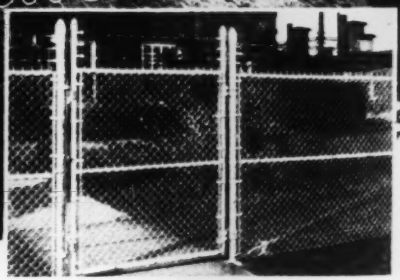
As subscribers to your most interesting magazine we should be grateful if you would furnish us with some assistance concerning the export of bar material to the U. S. A.

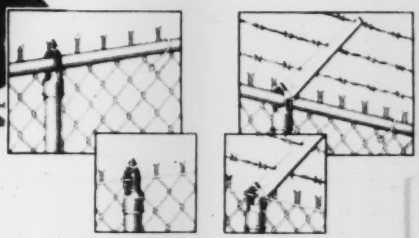
We have, at present, good stocks of bar material to specifications SAE 3140 and SAE 4140, in the annealed condition. In the course of a few weeks we will also have the 3140 in the heat treated condition and 4140 in that state at the end of the year.

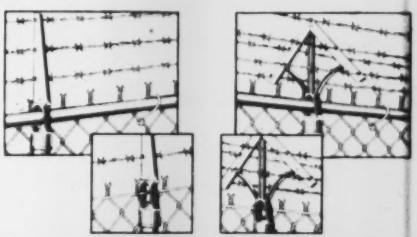
It occurs to us that as a result of the recent steel strike in your country, and from the information you publish in your magazine as to demand, that we could usefully export some of this material to certain areas in the States.

Would you, therefore, please inform

Here's What It Takes For Better Property Protection







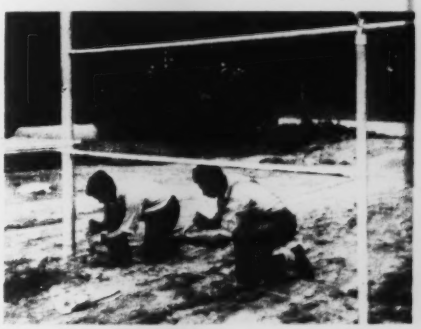
12 STYLES TO CHOOSE FROM

CONTINENTAL Chain Link Fence provides better protection features—more value for your fence dollar. You get Continental's engineered fence erection . . . planning and installation of one of twelve fence styles. You get Continental's rigid framework—heavy, closely spaced line posts, braced and secured by tough rods and wire. You get Continental's rugged fabric . . . weather-proofed by a hot zinc bath, after weaving, for maximum rust resistance. And you get Continental's easy swinging, welded gates, on new pivot hinges. That's what you get with Continental fence, and that's what it takes for better, longer-lasting property protection.

TAILORED TO FIT EACH SPECIFIC INSTALLATION

Continental's experienced fence engineers help you plan and lay out fence, tailored to fit your property.

Line posts are solidly set in concrete—fabric carefully stretched and secured for permanence.



ERECTION FOR PERMANENCE

*TRADE MARK REG. U.S. PAT. OFF.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

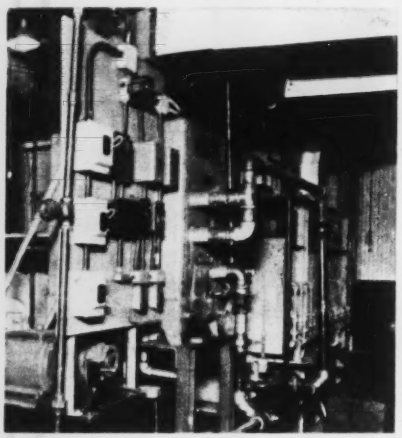
GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

Improve Quenching and You Get Better Heat Treating

Your Department can have a better arrangement with Niagara Equipment that saves much space and increases your production.

This quench bath cooler gives you control of temperature and pays for itself quickly with water savings



● The NIAGARA AERO HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air by evaporative cooling. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara Aero Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletin 90.

NIAGARA BLOWER COMPANY

Over 48 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U. S. and Canada

LETTERS

Concluded from preceding page

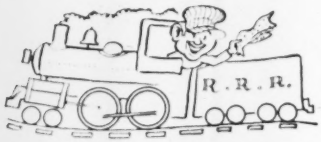
us what import regulations we would have to observe and what duty would have to be paid in the event of our finding customers for this steel in your country.

D. V. Bacon
J. T. Coutts & Co. Ltd
Vancouver, B. C.

● *Import regulations will be forwarded —ED.*

Reading Up on Fairless Works

We have seen your article on the new Fairless Works (Sept. 22, p. 121) and are vitally interested in this new plant, and related plants coming to the East.



While your magazine cover would indicate that only the Pennsylvania Railroad goes into this plant, I am pleased to state that the Reading Co. is making an expenditure in excess of a million dollars, and will participate in a very considerable tonnage of raw materials going into Fairless Works, and of finished product coming out.

W. A. Clem
purchasing agent
Reading Co.
Philadelphia

● *Reading also will service the Fairless Works —ED.*

Bort Substitute Found?

RE PAGE 109 SEPTEMBER 22 ISSUE OF STEEL AND ARTICLE HEADED WANTED TESTING SPEEDUP. PLEASE ADVISE WHOM TO CONTACT IN NATIONAL PRODUCTION AUTHORITY AS I HAVE DEVELOPED SYNTHETIC DIAMOND SUBSTITUTE HARDER THAN BORT AND SUBSTANTIALLY CHEAPER TO PRODUCE.

J. T. Kilbridge
Connecticut Research Foundation
Bridgeport, Conn.

● *NPA man in charge of seeking substitutes for diamond bort is Herbert A. Newman who can be phoned on STerling 5200, extension 7817, Washington —ED.*

Strip Story To Be Retold

May we have permission to reprint the article "Strip Width Held to Close Limits" by G. R. Petersen (Sept. 29, p. 94). Credit will, of course, be given STEEL.

P. C. Caldwell
Apparatus Sales Division
General Electric Co.
Schenectady, N. Y.

● *Permission granted.—ED.*

SPRING WIRE

For uniform quality, we're sure this spring wire is the best we've ever made

ROEBLING is about the largest specialty wire manufacturer in America. And with progressively improved facilities and more positive controls we are constantly turning out wires with a higher uniformity of gauge, finish and mechanical properties.

Among these products that save preparation time and boost production for users are mechanical spring wires including hard drawn, soft, annealed or oil-tempered M.B., H.B. and Extra H.B.; music wire; upholsterers' spring wire and valve spring wire...all in a full range of physical properties and finishes.

Reduce your machine shut-downs and step up overall production with the Roebling specialty wire that will meet your most exacting requirements. John A. Roebling's Sons Company, Trenton 2, N. J.

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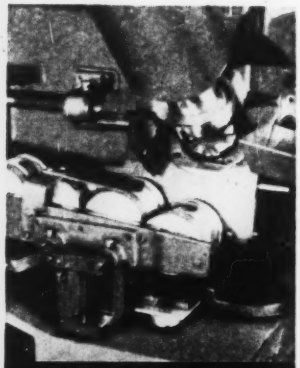
. . . untouched by human hands!

. . . to plus or minus .035 oz.!

. . . at 12 per minute rate!

pistons balanced automatically



. . . by this amazing new

Morris

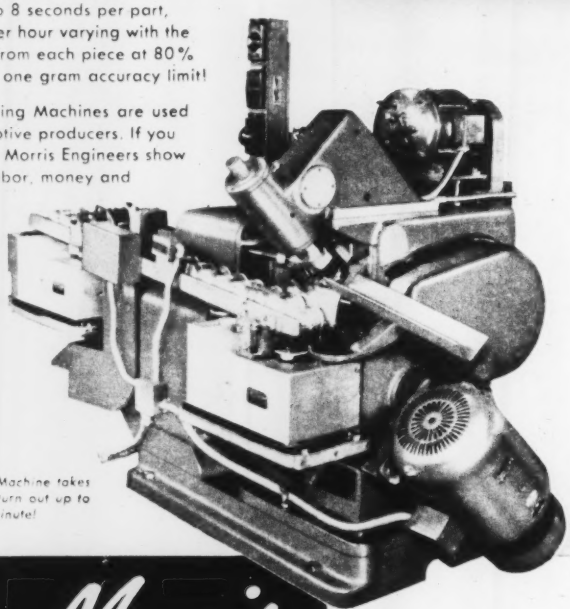
AUTOMATIC PISTON BALANCING MACHINE

For the first time, this MORRIS Mor-Speed Production Machine makes piston balancing 100% automatic. Parts are unloaded automatically from a standard conveyor, processed or rejected and returned to the conveyor "untouched by human hands."

Underweight or grossly overweight pistons are automatically rejected without interrupting the production flow. Depending on a cycle time ranging from 5 to 8 seconds per part, production is 450 to 720 parts per hour varying with the amount of metal to be removed from each piece at 80% efficiency and to a plus-or-minus one gram accuracy limit!

MORRIS Automatic Piston Balancing Machines are used by a number of the major automotive producers. If you have a piston production line, let Morris Engineers show you case history proof of time, labor, money and floor space savings.

Write today for NEW bulletin describing and illustrating the revolutionary MORRIS Piston Balancing Machine.



The Morris Automatic Piston Balancing Machine takes only 27.3 square feet of floor space to turn out up to 12 accurately balanced pistons every minute!

a better product at less cost with precision PLUS production

MOR-SPEED

Morris

THE MORRIS MACHINE TOOL COMPANY, 941 HARRIET ST., CINCINNATI 3, OHIO

A Message to ORDNANCE
Prime and Subcontractors
requiring
Cast Armor and QQS 681-B material

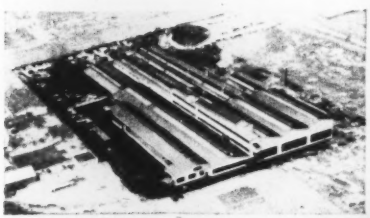
LET RIVERSIDE HELP SOLVE YOUR CASTING PROBLEMS

Riverside Foundry is ready to give you excellent service on cast armor and all types of QQS 681-B materials. *In fact, any steel casting specifications for which your contract might call.* We have a full staff of men who have spent years producing ordnance material.

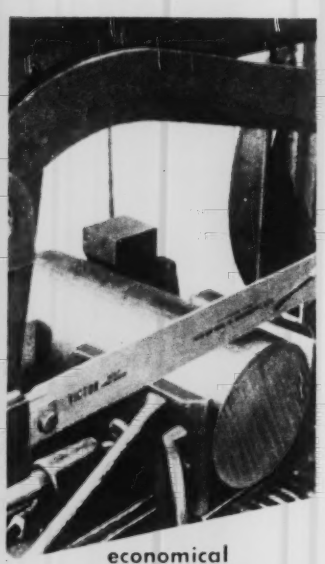
Our customers include many great names of American Industry: Chrysler, American Locomotive, International Harvester, Fisher Body and Ford Motor Company. *Ask them about Riverside.*

Call or write us at Riverside today.

For a dependable qualified source of steel casting requirements, see Riverside. You give us your drawings. The rest of the job is ours. Save yourself time, worry and loss of production. We are ready to do a complete job on any casting requirement.



The big modern Riverside Foundry at Bettendorf, Iowa has the best equipment to do the best job.



economical metal cutting with

VICTOR "Moly"® HIGH SPEED Power BLADES

Whatever your metal cutting problem, VICTOR "Moly"® High Speed Power Blades will cut your initial blade cost 15%, and give you the additional economy of more efficient cutting.

Quality makes VICTOR Blades industry's preference—top-quality, carefully heat-treated steel, fabricated on specially designed equipment, to give you fast, economical cutting and long blade life. Send for the free VICTOR Metal Cutting Booklet which tells you how to pick 'em—Gold "Moly"® High Speed or Silver Unbreakable High Speed.

ECONOMICAL SERVICE *from your* VICTOR DISTRIBUTOR

VICTOR "Moly"® High Speed Power Blades are always sold through the recognized Industrial Distributor because he is closest to your problems. You know and have confidence in him, and he can give you delivery from stock where and when you want it.

VICTOR

SAW WORKS, INC. • MIDDLETOWN, N.Y., U.S.A.

Makers of Hand and Power Hack Saw Blades, Frames and Metal Cutting Band Saw Blades

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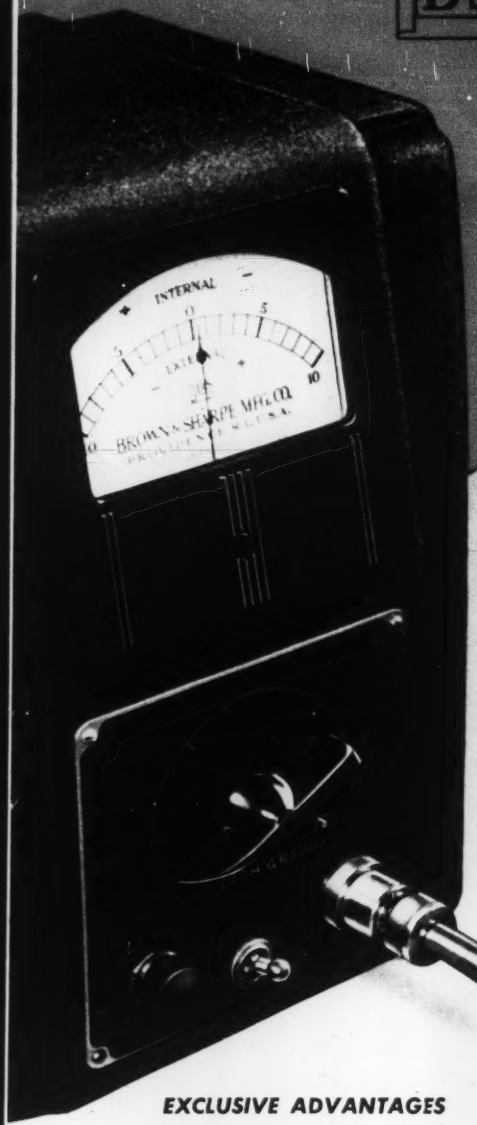
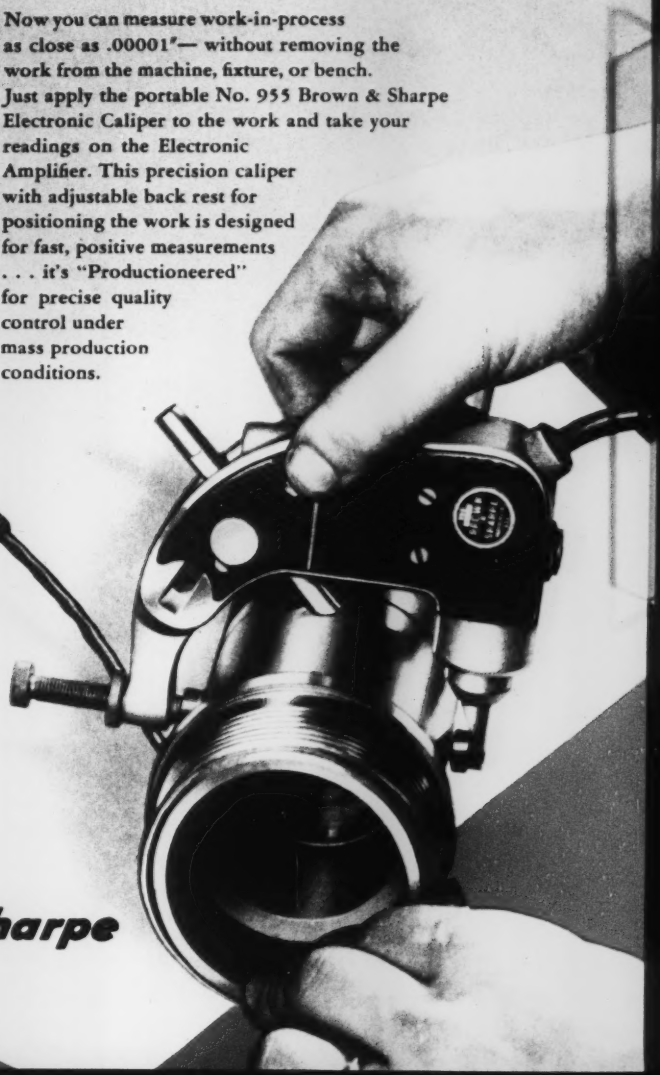
Productioneered

...for new high precision gaging

NEW No 955 ELECTRONIC CALIPER



Now you can measure work-in-process as close as .00001"— without removing the work from the machine, fixture, or bench. Just apply the portable No. 955 Brown & Sharpe Electronic Caliper to the work and take your readings on the Electronic Amplifier. This precision caliper with adjustable back rest for positioning the work is designed for fast, positive measurements . . . it's "Productioneered" for precise quality control under mass production conditions.



EXCLUSIVE ADVANTAGES

- Measures on the machine, fixture or bench
- Amplifier adjustable for readings in units from .0001" to .00001"
- Carbide measuring faces
- Only one master required for each setting
- Unaffected by dust or moisture
- Adjustable measuring pressure
- Aligning attachment for long work
- Easy to grip and apply to work

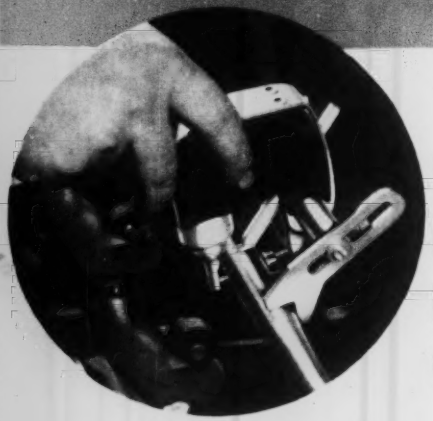
SEE NEXT PAGE FOR OTHER ILLUSTRATIONS AND SIZES

Brown & Sharpe

B&S

Productioneered

...for precise quality control on work from 0" to 4"



NEW No. 955 Electronic Caliper

Used in conjunction with the No. 950 Electronic Amplifier, the new No. 955 Brown & Sharpe Electronic Caliper allows you to measure precisely in units varying from .0001" to .00001" without disturbing the work set-up. A measuring range from 0" to 4" is provided by four interchangeable jaws that attach securely to the caliper body. Each jaw has a range of 1" and requires only one master for any particular measurement.

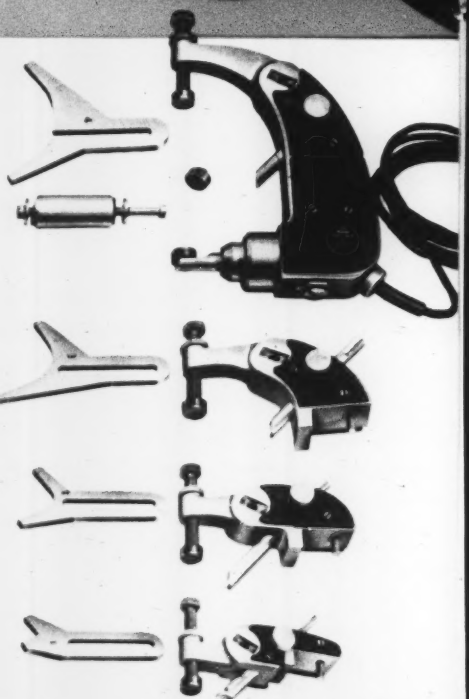
An aligning attachment, shown in illustrations above, is available for measuring long work pieces. Together with a spherical measuring point on the caliper jaw, this attachment provides a three-point bearing when the caliper is applied to the work — assures positive alignment and accurate readings.

ELECTRONIC CALIPER SETS

With the complete No. 956 set shown you can measure any size work from 0" to 4". It includes the caliper body, all four interchangeable jaws, and aligning attachment in a wooden case. The Electronic Caliper is also available in set No. 957, having the same range as set No. 956, but without the aligning attachment.

Write for new illustrated catalog describing the full line of Brown & Sharpe Electronic Production Measuring and Inspecting Equipment. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

WE URGE BUYING THROUGH THE DISTRIBUTOR



Brown & Sharpe

Milling Machines • Grinding Machines • Screw Machines • Cutters
Machine Tool Accessories • Machinists' Tools • Johansson Gage Blocks
Electronic Measuring Equipment • Permanent Magnet Chucks • Pumps

Why Burn Down Your House for Roast Pig?

IN ancient China, men ate meat raw. But one day, while Ho-ti the swineherd gathered mast for his hogs, his stupid son Bo-bo, playing with fire, burned down their straw hut. Bo-bo sniffed the odor of burnt pig. He touched one to see if it was still alive, scorched his fingers, put them in his mouth and was amazed at the delicious taste. Father came home and caught his son devouring a pig. Ho-ti tried one, too, found it intoxicatingly sweet and satisfying.

Thereafter, neighbors observed feverish building of new straw huts at Ho-ti's, followed always by conflagrations. The secret leaked and fires became widespread. In a few weeks even his Lordship's town house was on fire. Finally, straw for hut building disappeared from the market and young pigs could not be had for love or money. At last, after many generations, a wise man arose who said that a pig could be roasted without burning down an entire house.

Thousands of years later, we Americans feast deliriously on "roast pig." Accompanying our delights are fires of inflation, which can destroy our values just as certainly as the roasting of Ho-ti's pigs consumed his earthly possessions. But surely we need not await the coming of a sage to tell us not to burn down our houses to enjoy the delights of roast pig!

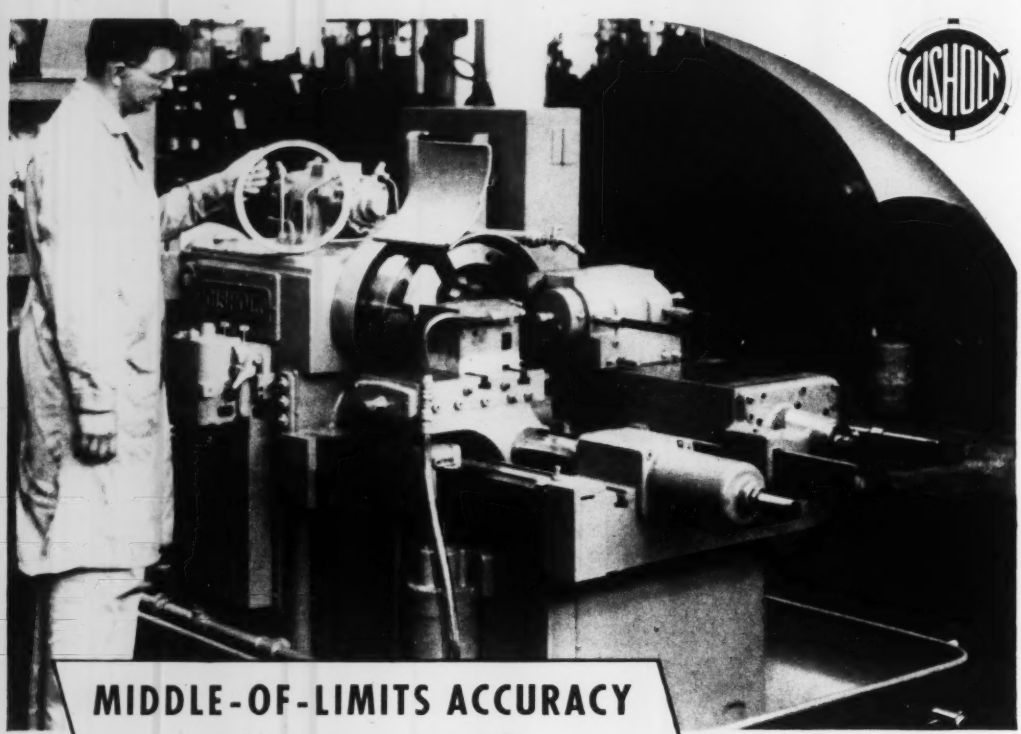
Let us unite to stop the ruinous flames of inflation. Curb wasteful and unnecessary government spending. Balance our Federal budget. Control our national debt and reduce taxes. Only in this sane way can we produce more straw and enjoy our houses, raise more pigs and eat them, too.

QUALITY YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.



MIDDLE-OF-LIMITS ACCURACY

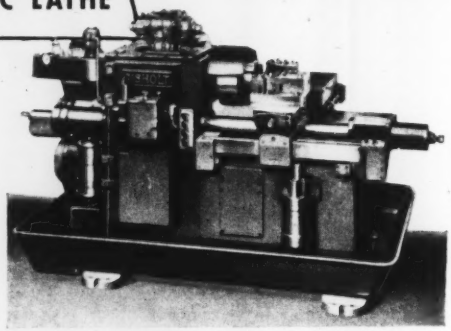
for years on end

NO. 12 HYDRAULIC AUTOMATIC LATHE

Loss of accuracy due to wearing parts? You won't get it with this modern automatic lathe—even after years of hard service. There are no complicated mechanisms to wear—it's that simple!

All parts having to do with tool movement are completely surrounded by oil and lubricated under pressure. Both carriages move on hardened and ground steel surfaces. For all practical purposes, there is no wear-out. Since both front and rear tool slides feed against and dwell at positive dead stops, utmost accuracy is assured in finished dimensions.

Yes, you can count upon middle-of-limits accuracy for many years to come. What's more: you can count upon trouble-free operation that cuts maintenance bills to almost nothing. Write for literature.



THE GISHOLT NO. 12 HYDRAULIC AUTOMATIC LATHE **is a heavy, rugged machine, yet well suited for light, fast jobs.**

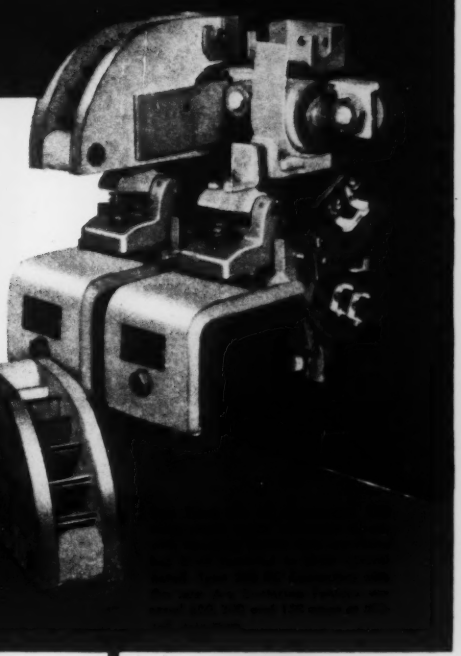
GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

NEW

Fast Arc Blowout



Mill Type 260 DC CONTACTOR

- **Speeds Arc Interruption**
- **Extends Contact and Chute Life**

THIS NEW HEAVY DUTY CONTACTOR offers an *entirely new* principle of arc interruption . . . developed by Allis-Chalmers engineers to meet the exacting needs of industry.

Contact and arc chute life have been greatly extended by an *arc centering blowout*. In centering the arc, increased blowout action and fast interruption results from a combination of thermal convection and magnetic action. Contact erosion is reduced and carbonization is minimized.

Other advantages of the Mill Type 260 DC Contactor include: accessible construction for easy maintenance; ROLLING contact action with no destructive scuffing; design simplicity which has eliminated troublesome linkages, arms and pivots.

The Type 260 DC Contactor featuring the new arc interruption principle has been designed and built to steel mill engineers' specifications. Years of field and factory tests have proved this heavy duty contactor far exceeds NEMA requirements . . . have established it as an efficient, trouble-free performer under the most severe operating conditions. Call your nearby Allis-Chalmers District Office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 14B6505A

A-3871

ALLIS-CHALMERS

How Arc Interruption Principle Works

Arc Chute Assembly consists of triangular metal plates with U-shaped segments mounted alternately. Plates are insulated from each other and are placed at right angles to circumference of contact travel.

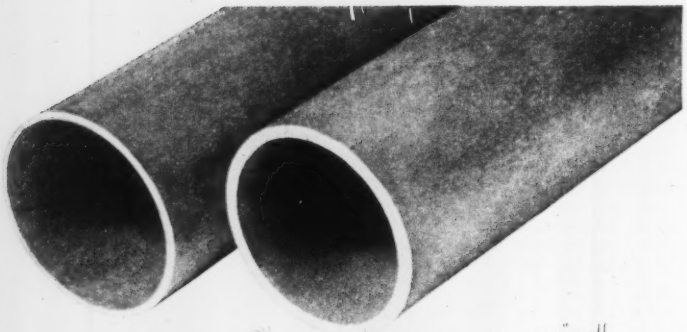
Metallic segments act as individual blowout coils.

Arc is forced upward along arc runner by blowout coil and impinges on metal segment of arc chute.

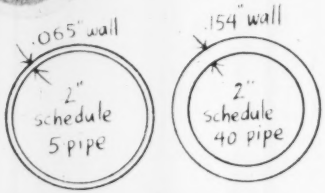
As contacts separate further, arc is stretched across an increased number of segments.

Arc rises quickly due to thermal and magnetic action of each individual metal segment.

you save money



you save time and labor



you get greater flow and capacity

when you specify light wall schedule 5 pipe

WHAT SCHEDULE 5 PIPE IS—

A light wall pipe, Carpenter Schedule 5 gives you more feet of pipe for every pound of scarce stainless steel. So you can quickly see how Schedule 5 reduces your cost per foot. Plus the fact that the larger I.D. means increased flow area.

HOW SCHEDULE 5 REDUCES COSTS

First saving is 40% to 50% on the cost of your pipe.

Since Schedule 5 is considerably lighter, this means quicker and easier installation.

And, because the increased capacity of Schedule 5 lets you use the next smaller pipe size, you can reduce substantially your costs of valves, fittings, etc.

FITTINGS ARE AVAILABLE

This pipe is easily adapted to use with existing lines of tubing or Schedule 40 and 10 pipe, using simple connectors. Fittings as well as stocks of Schedule 5 pipe are carried by conveniently located Carpenter distributors.

ADDITIONAL ADVANTAGES

Tubing sizes can now be replaced with light wall *pipe* . . . for ready hook-up with standard valves, pumps and other equipment which is normally manufactured in pipe sizes.

Data Sheets give you complete information about Carpenter Schedule 5 Stainless Pipe. Write for your personal copy. THE CARPENTER STEEL COMPANY, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

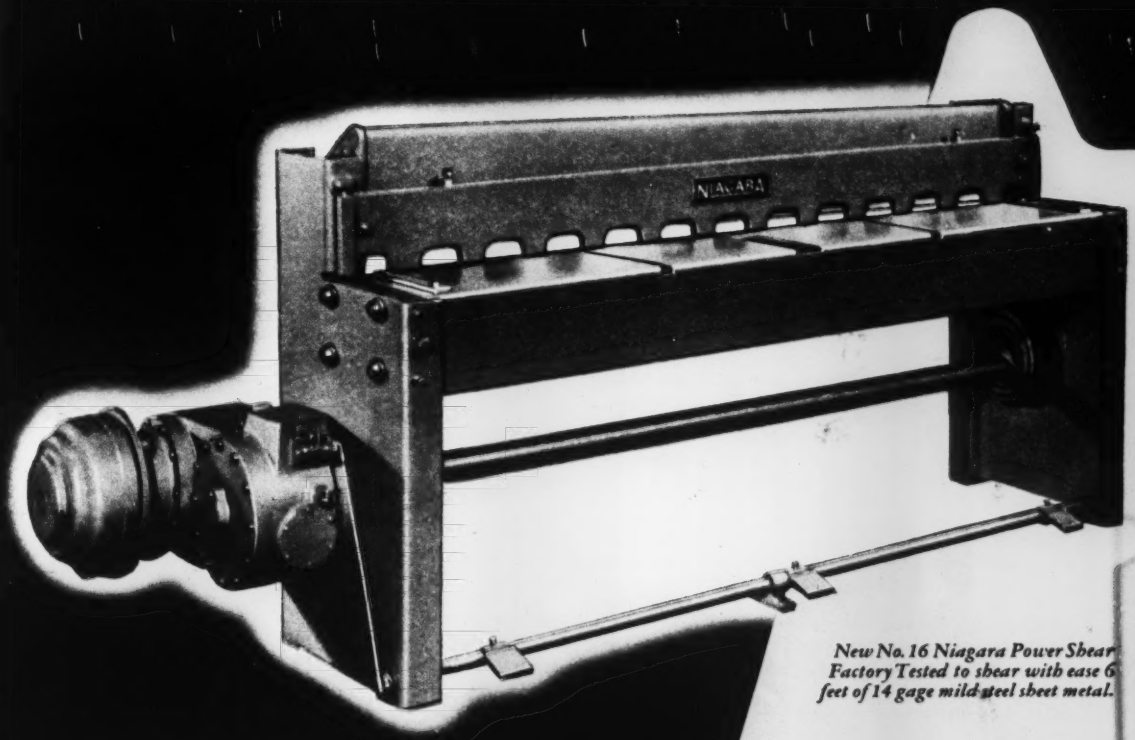
Carpenter

THE U.S. NEEDS YOUR STEEL SCRAP NOW

STAINLESS TUBING & PIPE

Analysis · Tolerance · Finish

- guaranteed on every shipment



New No. 16 Niagara Power Shear Factory Tested to shear with ease 6 feet of 14 gage mild steel sheet metal.

NIAGARA ANNOUNCES

- Greater production at 85 cuts per minute
- Constructed of unbreakable steel throughout
- Closed box section bed and cross-head for maximum rigidity
- A new leader in styling
- New hi-power totally enclosed drive
- Famous patented Niagara Sleeve Clutch
- All gears and clutch operate in bath of oil
- Four cutting edge knives
- Entire drive and main shaft operate on anti-friction bearings
- Cam actuated detent eliminates brake. Never needs adjustment
- Selective control for continuous or single stroke operation
- Parallel Back Gage, self measuring, ball bearing

Write for Bulletin 73

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

Manufacturers of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK • PHILADELPHIA

a few words about alloy steels

or... THE ALTERNATE ALLOY that never interrupted production

This could happen to you! A customer of ours was forced by restrictions and alloy shortages to switch from the Republic alloy steel he'd been using for years to one of the alternate alloys that he could get. He'd dreaded the problems of redesigning tools and dies, of revising heat-treating procedures, of heavy reject rates while the switch was being made.

But these troubles never came!

He called upon the Republic 3-Dimension Metallurgical Service . . . the Republic Field Metallurgist, backed up by the Republic Mill and Laboratory Metallurgists. These three men worked with the customer's metallurgist and his production foreman. Together, they analyzed his requirements, recommended the best available alternate steel, worked out the way to form the steel and heat-treat it.

The shift was made with almost no interruption, and never a headache.

We may be able to do the same job for you . . . and to back up our recommendation with one of the many fine alloys produced by Republic . . . world's largest producer of alloy and stainless steels.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC STEEL

ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

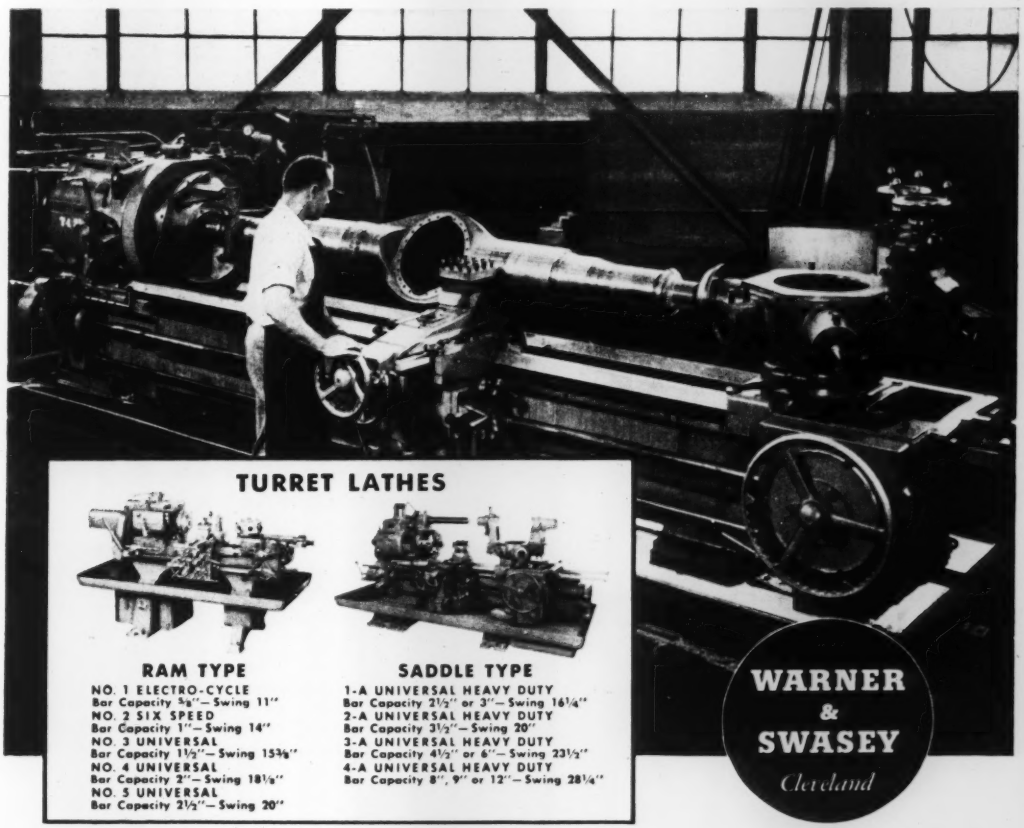
"KING SIZE" or "REGULAR"

WARNER & SWASEY OFFERS BOTH

● This Warner & Swasey in the plant of a large road machinery builder is a good example of what we mean when we say Warner & Swasey Turret Lathes are built in sizes and capacities to handle all sorts of jobs. This machine, a 4-A Universal Heavy Duty Saddle Type Turret Lathe, has a bed six feet longer than standard in order to turn the "king size" rear axle housings used in the giant roadbuilding machinery. And tolerances of .001" are held on these large pieces.

When you buy a Warner & Swasey—whether it's to handle the $\frac{5}{8}$" bar capacity work of the No. 1 E-C, or jobs requiring the 12" bar capacity of the big 4-A—you buy a machine with an industry-wide reputation for ruggedness and extreme precision. It's a machine you can count on for high productivity, low upkeep, ease of operation, and dependability in holding its built-in accuracy for many years ahead.

So whenever you have a turning problem, call in your nearest Warner & Swasey Field Representative. He'll work with you and recommend the right machine for your range of work.



TURRET LATHES

RAM TYPE

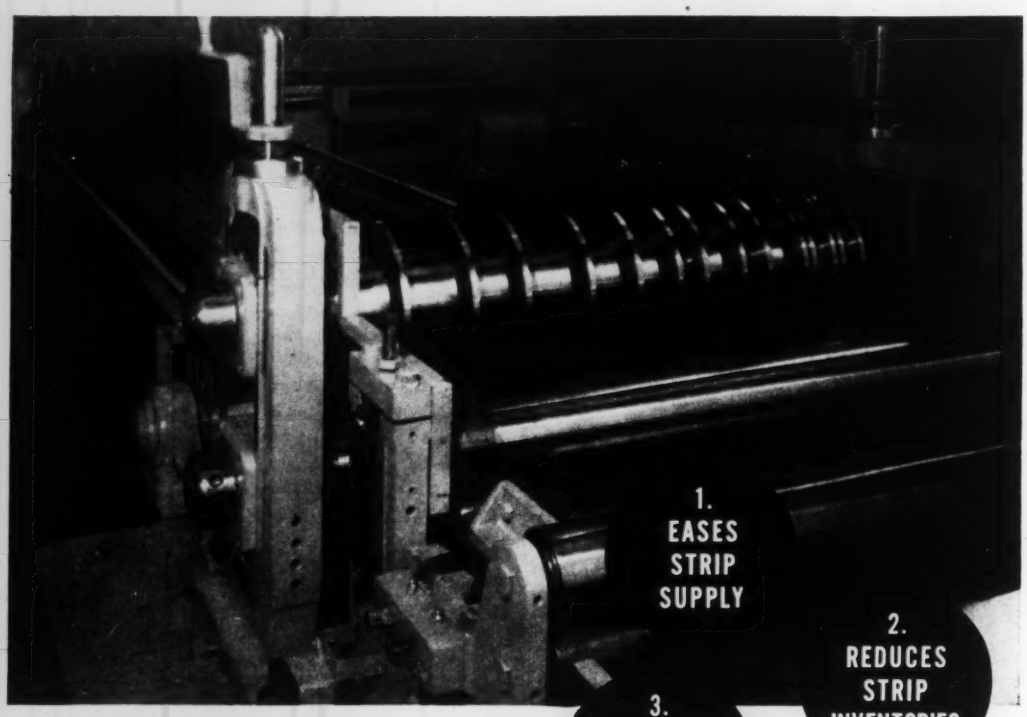
NO. 1 ELECTRO-CYCLE
Bar Capacity $\frac{5}{8}$"—Swing 11"
NO. 2 SIX SPEED
Bar Capacity 1"—Swing 14"
NO. 3 UNIVERSAL
Bar Capacity 1$\frac{1}{2}$"—Swing 15$\frac{3}{8}$"
NO. 4 UNIVERSAL
Bar Capacity 2"—Swing 18$\frac{1}{8}$"
NO. 5 UNIVERSAL
Bar Capacity 2$\frac{1}{2}$"—Swing 20"

SADDLE TYPE

1-A UNIVERSAL HEAVY DUTY
Bar Capacity 2$\frac{1}{2}$" or 3"—Swing 16$\frac{1}{4}$"
2-A UNIVERSAL HEAVY DUTY
Bar Capacity 3$\frac{1}{2}$"—Swing 20"
3-A UNIVERSAL HEAVY DUTY
Bar Capacity 4$\frac{1}{2}$" or 6"—Swing 23$\frac{1}{2}$"
4-A UNIVERSAL HEAVY DUTY
Bar Capacity 8", 9" or 12"—Swing 28$\frac{1}{4}$"

WARNER & SWASEY
Cleveland

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY



Yoder Multiple Rotary Slitters

● The advantages of doing your own slitting far exceed the mere saving in cost per ton of strip, even though this saving may be sufficient to repay your investment in less than a year.

Most fabricators after installing a Yoder slitter agree that one single advantage, viz., the ability to use mill-width coil stock instead of slit strands, by multiplying their sources of strip supply, has more than justified the cost of the slitter.

The Yoder line of slitters, uncoilers, recoilers, scrap choppers and other slitting line equipment, is the most complete and highly standardized. There are more Yoder slitters sold than of any other make. Yoder engineers are anxious to assist you in determining the size and kind of slitting equipment which will best serve your needs, at the lowest cost. Yoder Slitter Book deals broadly with both the economics and mechanics of slitter operation. It is yours for the asking.

THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio

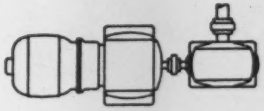
Complete Production Lines

- ★ **COLD-ROLL-FORMING** and auxiliary machinery
- ★ **GANG SLITTING LINES** for Coils and Sheets
- ★ **PIPE and TUBE MILLS**–cold forming and welding

ENGINEERING YODER MANUFACTURING

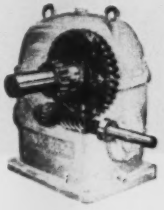
Which of these speed reduction jobs is yours?

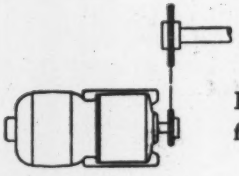
High-ratio reduction with right-angle takeoff?



Get a LINK-BELT Worm Gear Drive

Reduction ratios: 3.1:1 to 8000:1. Torque: 1400 to 123,000 in. lbs. Output shaft rpm: 0.22 to 564. Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.

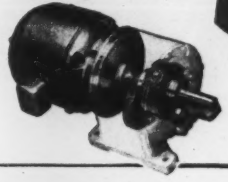


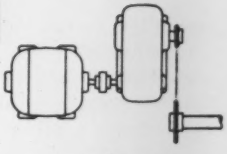


Restricted space for mounting?

Get a LINK-BELT Gearmotor

Reduction ratios: 6.2:1 to 292:1. Hp range: 1 to 30. Output shaft rpm: 6 to 280. Drawing shows gearmotor with roller chain drive.

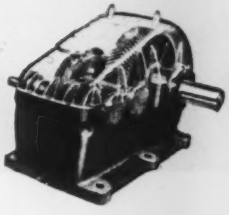




High hp with parallel shaft takeoff?

Get a LINK-BELT Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1. Hp range: ½ to 1000. Output shaft rpm: 2 to 600. Drawing shows motor with herringbone gear and roller chain drives.



Yes, LINK-BELT builds all 3

NO LONGER need speed reduction be the limiting factor in a design or application problem. Because no *one* speed reducer solves every reduction problem, Link-Belt builds all three—Helical, Herringbone and Worm. Now it is only necessary to choose the right type of Link-Belt enclosed gear drive . . . and select the hp and reduction ratio that fit your requirements. You can get complete engineering information from the Link-Belt office near you.

12,000

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities.

NATIONAL . . . Your Forging Laboratory!

Out of this unique "forging laboratory" have come many significant advancements . . . the high speed forging press . . . modern horizontal Forging Machine . . . blank-preforming Reduceroll . . . Semi-Hot Rivet Header . . . Boltmaker . . . roll-over transfer Cold Nut Former . . . Automatic Precision Nut Tapper . . . Nail-Maker . . . Cold Headers for bearing rollers and balls, for tubular and solid rivets, and thousands of other parts . . .

In addition, we've been continually developing new forging applications and methods right along . . . establishing basic principles of die design as influenced by metal flow, both hot and cold . . . upsetting . . . deep piercing . . . extrusion . . .

Some of *tomorrow's* top developments in the forging field are now on our drawing boards and test floors!

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO.

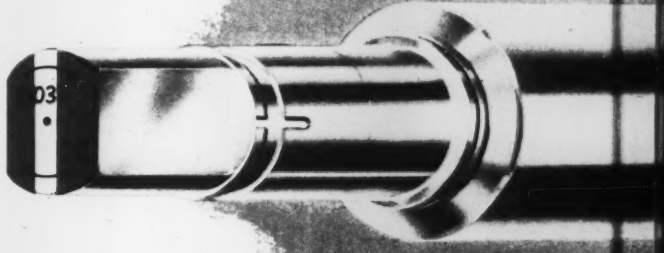
DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES—MAXIPRESSES—COLD HEADERS—AND BOLT, NUT, RIVET, AND WIRE NAIL MACHINERY

Hartford Detroit Chicago

to modern hot strip rolling...

MACK-HEMP ROLLS *with the striped red wabblers* do a consistent job for the skilled hot strip mill operators who use them, because Mack-Hemp's engineers coordinate their roll research and development program with the demands of the mill operators.

As a result of this progressive policy, Mack-Hemp rolls *with the striped red wabblers* give a plus value to mill operations.

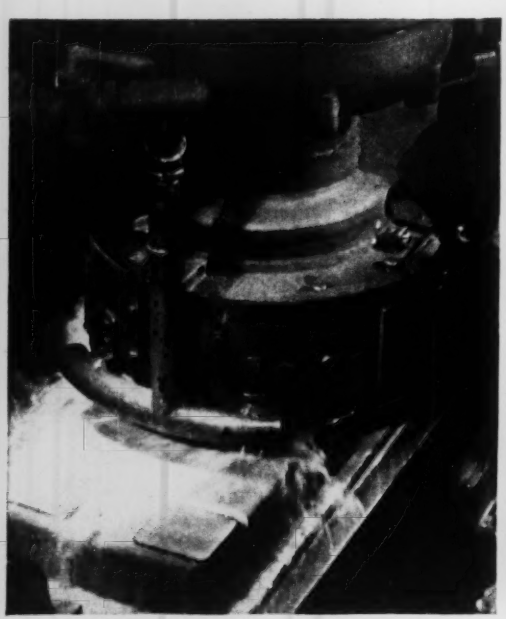


Because Mack-Hemp is always working to make each roll better than the one before—because Mack-Hemp keeps up with the latest developments in rolling mill practice, it's a good idea to keep your eye on what's new and different at Mack-Hemp.

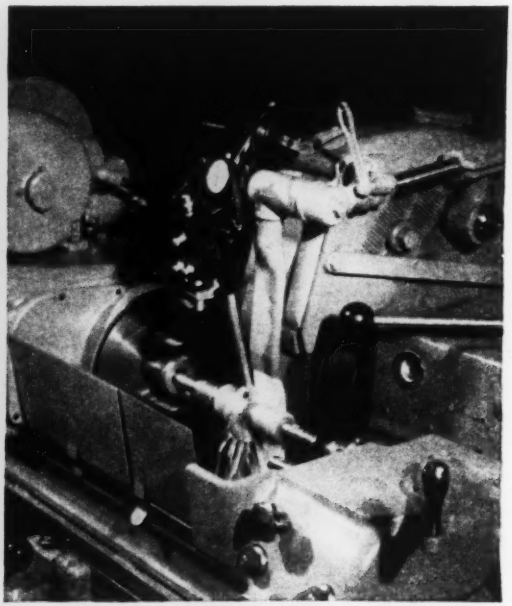
MACKINTOSH-HEMPHILL
COMPANY
Makers of the Rolls with the Striped Red Wabblers
PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special alloy castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . Mackintosh-Hemphill rotary straighteners . . . improved Johnston patented corrugated cinder pots and slag-handling equipment . . . shape straighteners . . . end-thrust bearings . . . shears . . . levellers

Look for the Mack-Hemp Rotary Straightener at the A. Milne & Co. Exhibit, Metal Show Philadelphia, week of October 20, 1952



SURFACE GRINDING. For fast, cool cutting action Norton wheels, cylinders and segments are unbeatable. 32 or 38 ALUNDUM abrasive for hardened steels and CRYSTOLON abrasive for gray iron and non-ferrous metals.



O.D. GRINDING. Norton O.D. wheels in the abrasives, grain sizes and bonds for best results on every material are sure protection for big grinding machine investments.

NORTON BRINGS YOU

More types of abrasive products... for More savings...on More jobs

You'll find the right answers to every one of your grinding problems in the Norton line of abrasive products. First, because it is the world's most complete line — offering you more choices than any other. Second, because Norton Research — which has chalked up an impressive list of "firsts" in abrasive development and Norton's endless field testing — make sure that every Norton abrasive product will deliver top performance on the work it is designed for.

That's the combination of variety and efficiency that will cut time, labor and costs on every grinding job you do.

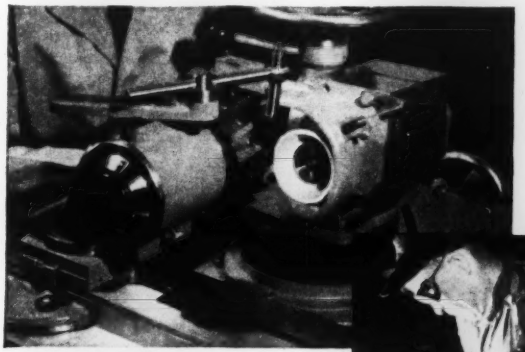
SEE YOUR NORTON DISTRIBUTOR for practical help in any grinding application. He knows Norton products — what they will do and what they won't do — and you'll find that his aid in selecting the right ones for *your* jobs is a real short cut to better, lower cost grinding . . . NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

*Trade Marks Reg. U.S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

Making better products to make other products better

TOOL AND CUTTER GRINDING. Norton New-Process wheels have no equal for uniformity, identical wheel performance and long even wheel wear. 32 ALUNDUM* abrasive for carbon and alloy steel, CRYSTOLON* abrasive for cemented carbides.

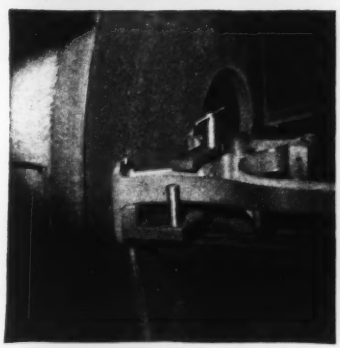


MOUNTED WHEELS AND POINTS. Hundreds of sizes and shapes for smooth-as-silk cutting action, with no bounce or vibration. Each one is trued on its own spindle to eliminate "breaking in" and to insure its running absolutely true.

POLISHING AND LAPPING. ALUNDUM grain comes in surface treatments and grain sizes for best results on every polishing job. And precise sizing makes ALUNDUM and CRYSTOLON abrasives favorites for even the fussiest lapping jobs.

ROUGH GRINDING. On swing frames, floor stands or portable grinders, Norton wheels "hug that work," to cut time and costs. And Norton *Reinforced Hub* Wheels are the safest, most versatile ever made.

BARREL-FINISHING. ALUNDUM tumbling abrasive, being *all* aluminum oxide, cuts without glazing, and has the hardness and toughness to stand repeated use. It's the abrasive for real precision-finishing.

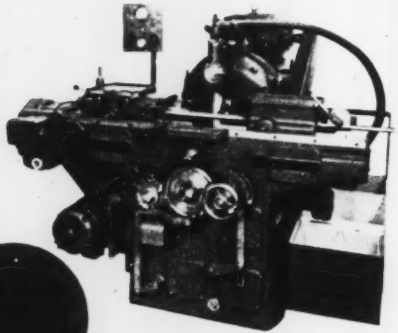


DISC GRINDING. Norton ALUNDUM and CRYSTOLON discs boost production and reduce down-time. They leave flat surfaces straight and smooth, with no excess heat to cause warpage.

INTERNAL GRINDING. Being identical in grinding action, Norton *New-Process* wheels can be changed without machine adjustments. That and uniform top performance make them valuable production boosters.

CUTTING-OFF. For wet or dry applications, high or low speeds, on any material, there's a Norton wheel in ALUNDUM or CRYSTOLON abrasive that's "made to order" for fast, economical cutting off.

Quality threading
AT MINIMUM COST



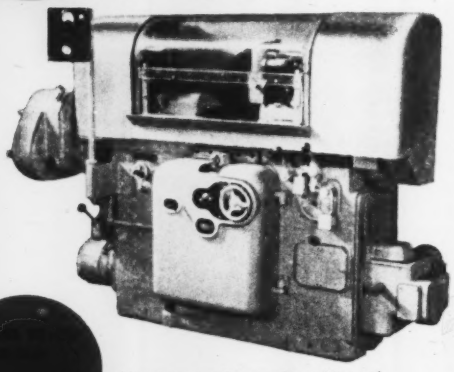
utomatic Thread Grinder is used for high
thread grinding with either single or multi-
wheels on relatively small parts.

JONES & LAMSON
AUTOMATIC THREAD GRINDERS:

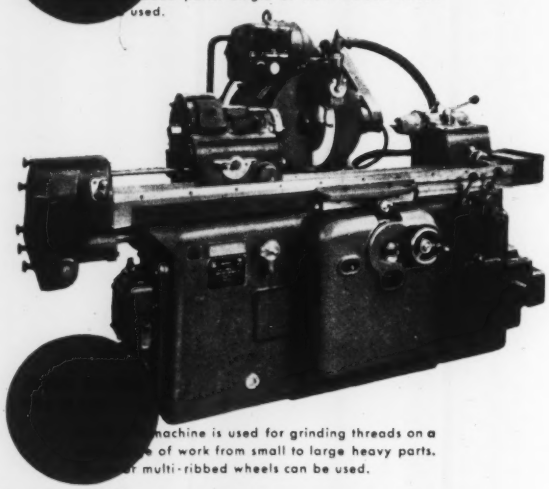
- Produce threads of better quality and more uniform finish
- Reduce handling cost
- Eliminate costly rethreading after heat treatment
- Eliminate expensive retooling when specifications change
- Reduce cost of gage maintenance

Built-in accuracy and automatic features, make any of these machines a paying investment for toolroom or production line.

- Automatic wheel truing
- Automatic infeed on successive cuts
- Automatic sizing
- Rheostat wheel speed control
- Diamond or crush dressing of wheels
- Multi-ribbed threading
- Right and left hand threading



achine is extremely versatile and is used
short run jobs on a great variety of preci-
ded parts. Single or multi-ribbed wheels
used.



achine is used for grinding threads on a
of work from small to large heavy parts.
multi-ribbed wheels can be used.

When measuring the value of a thread grinder remember the extra benefits of J & L top-flight construction. Write Dept. 710 for illustrated catalog.

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. Dept. 710

THREAD GRINDER DIVISION

What she doesn't know about BRASS
she could find out in a Flash!

It takes plenty of Brass to make a star. For stars must shine, and that takes light. But take Brass away, and she'd be dancing in the dark. Ask any stage electrician or Hollywood "top juicer" . . . he'll point out scores of unseen spots where *only Brass* can do the job that's being done so well. For that matter, look around your own home, from light bulbs to fuse box.

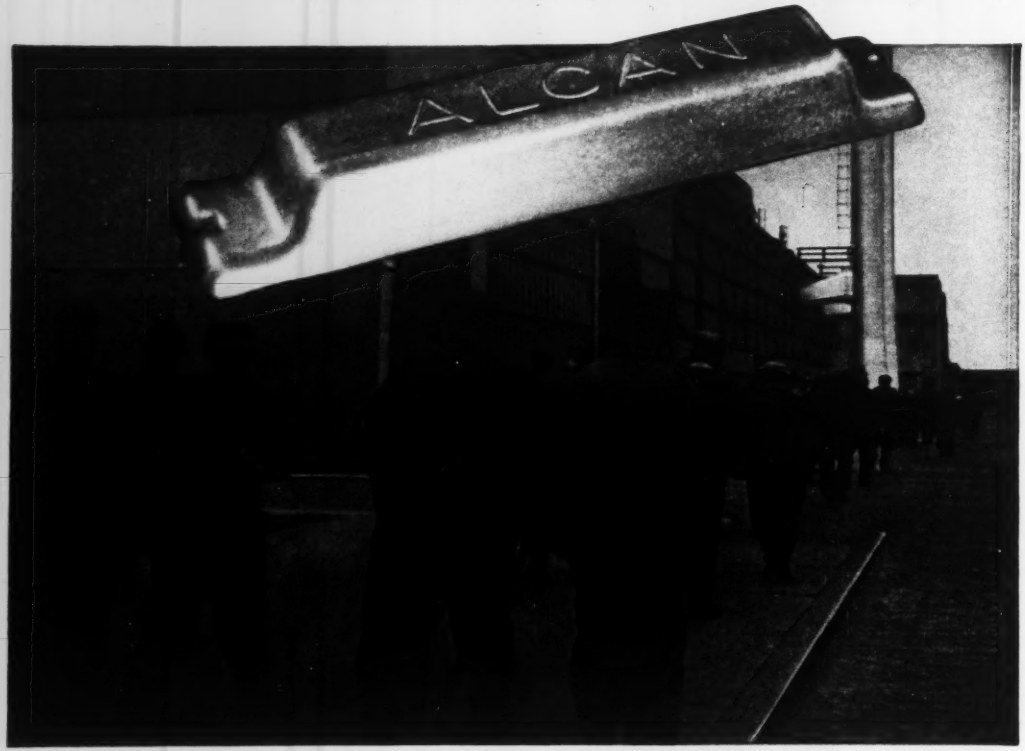
The reasons are not far to seek. *Only Brass* combines the qualities of relatively high conductivity, resilient strength, and almost endless service life. That's why in lighting, as in so many other fields of application, there is no substitute for the golden-ye!low alloy . . . cast, drawn and rolled as carefully as any precious metal . . . the way it's done here in the modern mills at Bristol. Now you may have a job, too, for which Brass is best, whether it's in electrical equipment or in costume jewelry. Want more light on this profit-laden possibility? Write:

• • •

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means **Brass at its Best**

MORE ALUMINUM FROM CANADA



. . . more workers at their vital jobs

The production of aluminum is nearing its all-time high. But because of defense requirements, there still isn't enough of this versatile metal to fill all needs.

To bring supply nearer demand, Aluminum Company of Canada, Limited ("Alcan") — whose products we distribute — is expanding its production capacity. Alcan in Quebec is constructing power and smelting facilities for producing 130,000,000 more pounds . . . and in British Columbia is putting in facilities which in their initial stage will provide 200,000,000 additional pounds of aluminum annually. So, in the future, we'll be able to help even more in keeping over a million American metal-workers busy — producing the thousands of different aluminum products that are so vital to defense, industry, farms, and homes throughout the Americas.

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Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

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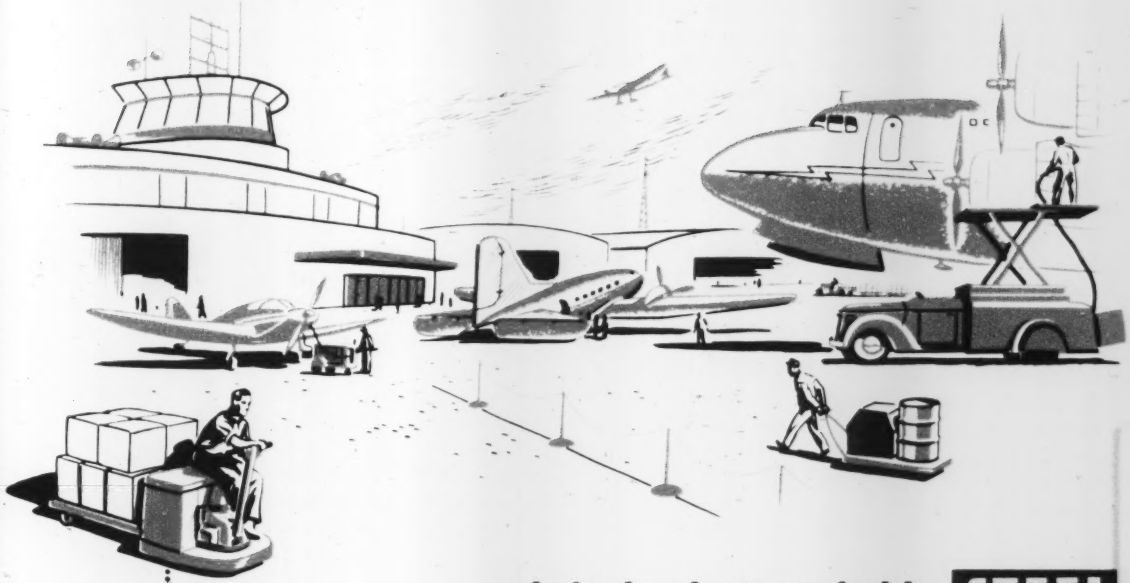
Look around the airport

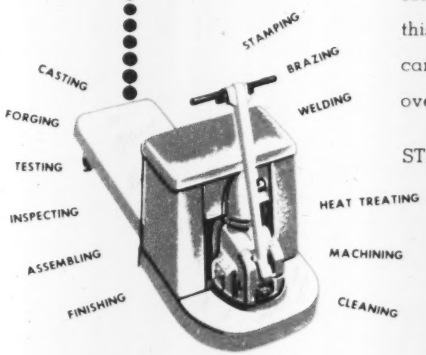
for Metalworking products...



...made in the plants reached by STEEL

Visit an airport and see the abundance of products turned out in Metalworking plants. In fact, wherever you are right now, notice the presence of an amazing variety of products that make Metalworking the biggest industrial market of all. Imagine the returns you can get with a sales promotion program concentrated on this market! And that's where STEEL can help you. For STEEL carries your advertising into the plants that do well over 90% of *all* Metalworking business.

STEEL • Penton Building • Cleveland 13, Ohio



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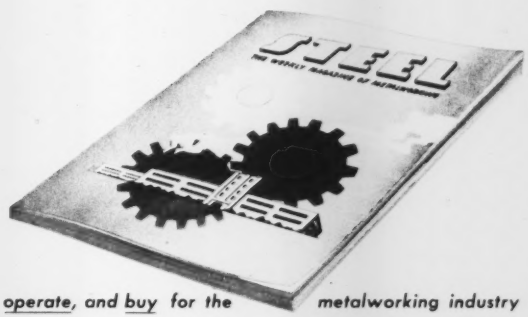


The magazine of the men who manage, operate, and buy for the metalworking industry

When all eyes can read the size

Assembly moves faster

good judgment calls for

PARKER-KALON®

when good design calls for

SOCKET SCREWS

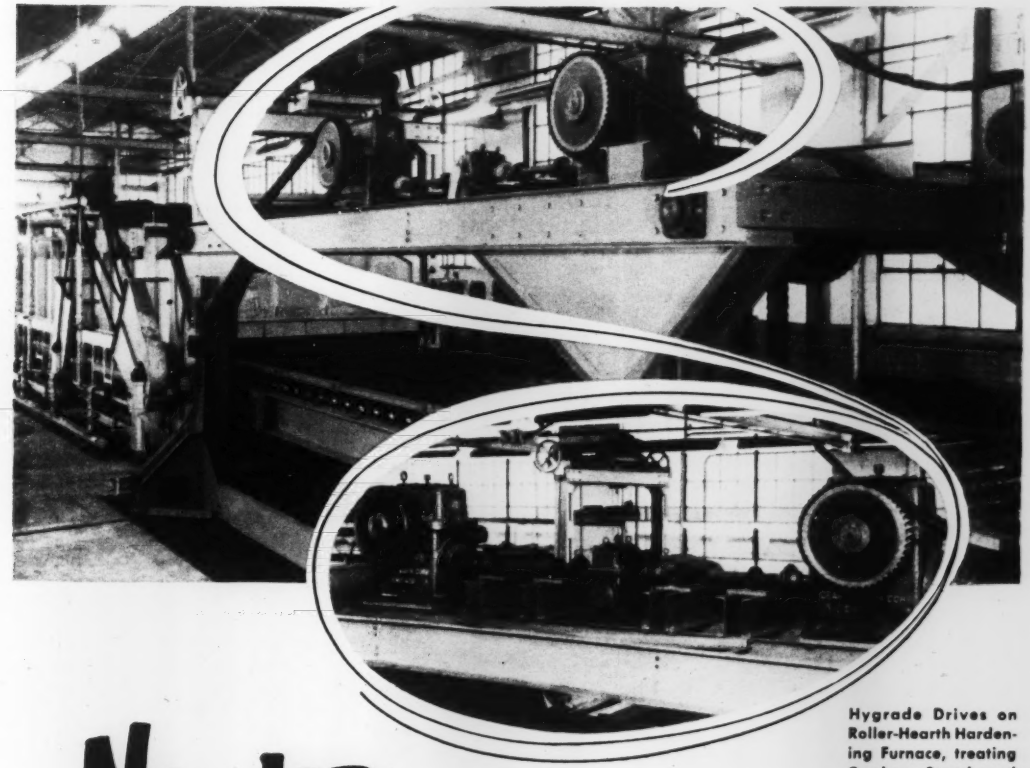
Your INDUSTRIAL SUPPLY DISTRIBUTOR — *your local source for P-K Socket Screws — works side by side with the P-K Assembly Engineer. Their combined efforts are solving many difficult problems of planning and procurement. Let them help you.*

Some sharp-eyed mechanics are expert at estimating the size of a plain head cap screw. But *most* assembly workers, and especially learners, need the screw that puts size beyond question . . . *the P-K Size-Mark Socket Head Cap Screw.*

The size is clearly incised on the head, can be seen at a glance. Saves time and wasted screws when sizes get mixed up, prevents errors and spoiled work. It's a good-sales feature, too, because installation and repair work on your product is simpler and easier.

Only P-K offers both Size-Mark and Gear Grip in Socket Head Cap Screws. Ask for samples. See how they save time and trouble all along the line. Parker-Kalon Corporation, 200 Varick Street, New York 14.

SIZE-MARKED CAP SCREWS • GROUND THREAD SET SCREWS • FLAT HEAD CAP SCREWS • STRIPPER BOLTS • PIPE PLUGS • HEX KEYS



Hygrade Drives on Roller-Hearth Hardening Furnace, treating Carbon Steel and Armor Plate, built by DREVER COMPANY, PHILADELPHIA.

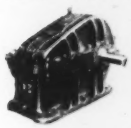
No Job For A Weakling

Handling hot plate is no job for weaklings. This is why the Drever Company chose rugged, powerful Hygrade Drives on this Roller-Hearth Hardening Furnace. These sturdy units not only handle this tough job with ease, but with minimum maintenance.

Wherever you have a speed reduction problem where low cost and rugged dependability are essential, the Hygrade Line of Enclosed Worm Gear Drives offers a solution. Available in a wide range of ratios and h.p. capacities in horizontal and vertical types. Vertical drives are also available with wider low speed bearing span to accommodate long, unsupported output shaft extensions.

FOOTE BROS.

Better Power Transmission Through Better Gears



Maxi-Power Drives

Line-O-Power Drives

Foote Bros.-Louis Allis Gearmotors

Foote Bros. Gear and Machine Corporation
Dept. X, 4545 South Western Boulevard
Chicago 9, Illinois

Please send a free copy of Bulletin HGB on Foote Bros. Hygrade Worm Gear Drives.

Name .....

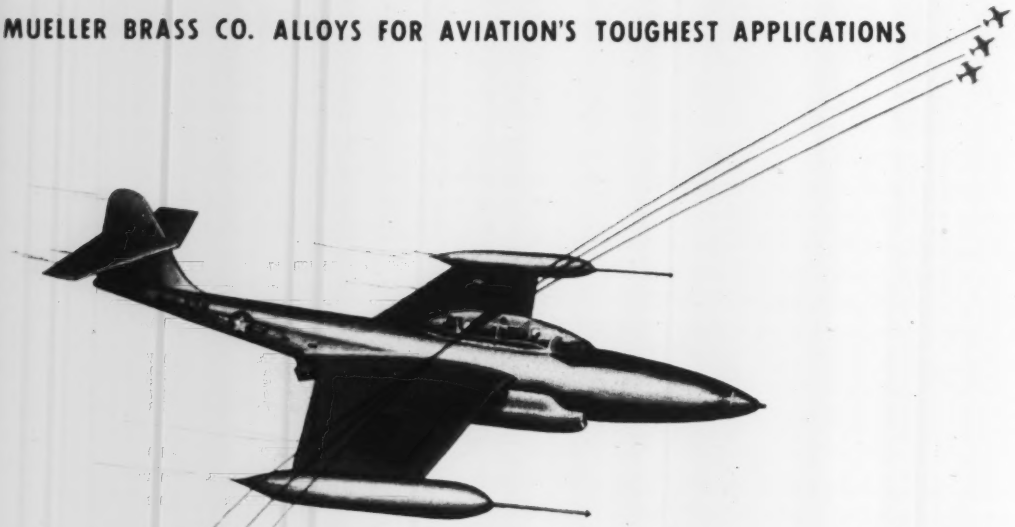
Company .....

Position .....

Address .....

City ..... Zone ..... State .....

MUELLER BRASS CO. ALLOYS FOR AVIATION'S TOUGHEST APPLICATIONS



"803" • This Mueller Brass Co. alloy is a high silicon iron-copper bronze ideally suited for roller bearing cages and other specialty parts in jet aircraft. It has good machinability and is extremely ductile. "803" metal is non-galling and retains its excellent mechanical properties up to 500° F. This alloy available as forgings but not as rod or castings.

"600" SERIES • "600" series are high strength bearing bronzes that do not contain any hard-to-get tin. They can be forged into relatively complicated shapes that are closer to size and require less machining than sand castings. "600" series metals have a low coefficient of friction and a tensile strength 2½ times that of the cast phosphor bronzes. They are highly resistant to wear and corrosion. These properties make "600" series highly desirable for use as parts on hydraulic equipment, actuators and instruments in jet aircraft. "600" series metals are available in standard or special extruded shapes up to 12' mill lengths. There is a "600" series alloy to suit your special bearing metal needs.

TUF-STUF • Mueller Brass Co. TUF-STUF aluminum bronze alloys have found wide acceptance for jet aircraft parts like the rotor for hydraulic pumps and other vital jet engine parts that must stand up. TUF-STUF alloys are corrosion resistant . . . strong and light and extremely long-wearing. They resist oxidation, even at high temperatures. TUF-STUF alloys are available in the form of forgings, rods and screw machine parts. They fill Federal Specification QQ-B-666, Grade B, and several other variations.

For complete information about "803" metal, the "600" series alloys and TUF-STUF, write today to

82

MUELLER BRASS CO. PORT HURON 19, MICHIGAN

For This Big
FLORIDA FRUIT CONCENTRATE
Cooperative

6,500 GALLONS PER MINUTE!.....

To be sure of always having an adequate, fully dependable and surprisingly economical supply of water, the Fosgate Citrus Concentrate Co-operative installed Layne Wells and Pumps at their new plant near Orlando, Florida. Their two units:—one 24-inches and the other 14-inches in diameter have a capacity of 6,500 gallons per minute—or 9,360,000 gallons daily if operated on a 24-hour basis. Built to Layne's standard of precision engineering, these wells and pumps will give years and years of excellent service with an amazingly low maintenance cost.

The same "know-how" experience that built a fine water supply for the Fosgate people of Florida—and for several thousand other plants, cities and factories,—is ready to serve you, whether for a single small unit,—or a number of large ones.

Layne

For Layne's Catalog on Well Water Systems write—

LAYNE & BOWLER, INC.
GENERAL OFFICES, MEMPHIS 8, TENN.

WATER WELLS
VERTICAL TURBINE PUMPS
WATER TREATMENT

NEW CORROSION INHIBITOR

STOPS RUST ...CUTS COSTS

If you make—ship—or store metal parts that rust can damage . . .

HERE'S IMPORTANT NEWS

New Shell "VPI" is effective in even the most difficult cases of rust prevention—and it's easy to use, too. "VPI" is a volatile corrosion inhibitor which comes in both crystal and paper wrap form.

Whenever moisture is in air, "VPI" vaporizes and makes air noncorrosive. "VPI" is applied quickly . . . containers do not have to be airtight. Container costs are reduced. Handling costs are lower because there's no greasing and degreasing . . . no need for expensive rust-removal jobs after part is unpacked.

Your Shell Representative can give you more information about the "VPI" method of rust prevention. Call him today. Or write to nearest address listed below.

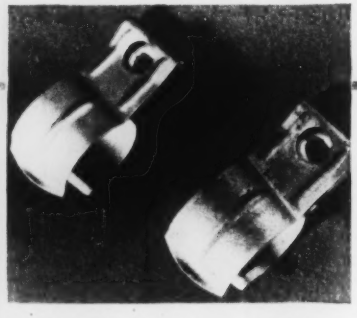
SHELL OIL COMPANY
50 West 50th Street, N. Y. 20, N. Y.
100 Bush Street, San Francisco 6, Calif.

SHELL®

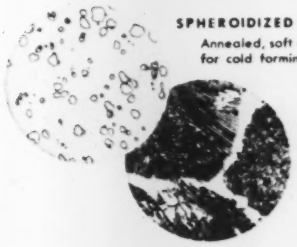
VPI

(a volatile corrosion inhibitor)

stops air and moisture from making rust.



"VPI" can be used many ways. The photo at the left shows powder being blown into critical areas of aircraft engines to prevent corrosion during storage. Photo at right shows identical spring clips stored 3 weeks in an open box. The upper clip was first sprayed with 4% "VPI" solution. Note that the "VPI"-treated clip suffered none of the rusting which is apparent on the lower clip.



SPHEROIDIZED
Annealed, soft and ductile — ideal for cold forming operations.

PEARLITIC
Temper-rolled in controlled hardness and strength for blanking.

made right — to make good on the job

WEIRTON HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

There is a Weirton cold-rolled spring steel that is just right for forming . . . and another exactly right for blanking. Whichever you use, you will find that it makes the operation easier, and meets the requirements for many products in which high fatigue resistance is essential.

Weirton High-Carbon Strip possesses, to an unusual degree, these highly desirable properties and qualities: Accurate response to heat treatment. • Uniformity of gauge and width. • Uniform chemical and physical properties. • Exact constancy of grain structure. • Controlled decarburization limits.

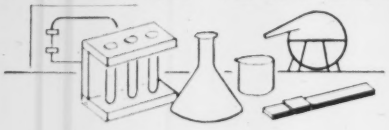
Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

102

Years OF EXPLORATION AND RESEARCH



Since William A. Burt, a government surveyor laying out the boundaries of the State of Michigan, discovered vast quantities of iron ore near Negaunee, Michigan, the bessemer convertor invented and the open hearth process perfected, this ore has been America's greatest natural resource and has provided an unceasing flow of the basic material for steelmaking. Its importance is felt in every industrial, commercial enterprise and in every American home. Without iron ore America could not maintain its might and its high standard of living.

The Cleveland-Cliffs Iron Company, since 1850, has devoted itself to keeping abreast of all the latest methods of production, research and exploration.

CCC

IRON ORE ★ ALLOYS ★ VESSEL TRANSPORTATION ★ COAL

The Cleveland-Cliffs Iron Company

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

Draftsmen work better, faster with this machine...

PHOTOS BY COURTESY OF THE UNIVERSAL DRAFTING MACHINE CORPORATION

By holding spindles absolutely rigid and keeping motion friction-free, Fafnir Ball Bearings contribute much to the vernier accuracy and effortless action of the Universal "Boardmaster". The ultimate results are more accurate sketches, layouts or detailing and "on the nose" template work in faster time . . . so important when good engineers and draftsmen are scarce.

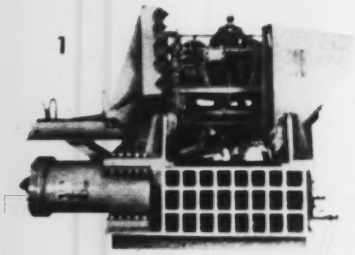
At three pivot points, pairs of extra-light, compact single row, Fafnir Ball Bearings give finger touch ease of movement without a trace of play. At the "centralized control unit", a large diameter Fafnir Bearing is used together with paired, preloaded and pre-lubricated Fafnirs. Six of the seven Fafnir Bearings used are Plya-Seal Type, which prevent lubricant leakage, keep out contaminants, and are lubricated for life.

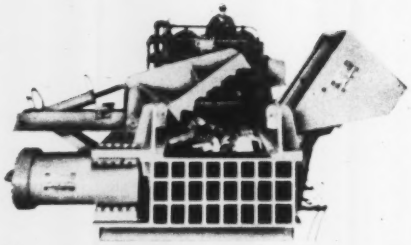
The faculty for providing custom-made types of bearings out of stock . . . from the most complete line in America . . . makes Fafnir the first source consulted by leading manufacturers. Maybe you can solve bearing problems this easy way. The Fafnir Bearing Company, New Britain, Conn.

Standard Radial Bearings

Wide Inner Ring Ball Bearings with Mechani-Seals

Plya-Seal Type Bearings

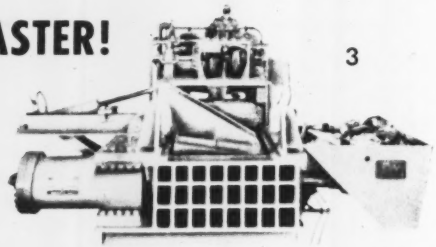




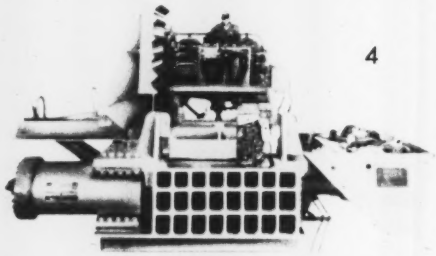
THE DEMPSTER-BALESTER

1-2-3-4 Hydraulic Operation

BALES YOUR SCRAP METAL FASTER!



The key to low cost scrap metal baling is fast, consistent baling. The big capacity *Model "600" Dempster Balester* high speed press pictured here will bale your scrap as fast as your crane can feed it! This tremendous baling speed is due to the Dempster Balester's 1-2-3-4 hydraulic cycle. 1. Skip Pan Loader loads charging box (see Photo 1). 2. Skip Pan returns to loading position as Auxiliary Compression Door compresses scrap with a 15-ton force (see Photos 2 and 3). 3. Charging box door is closed and scrap is baled, then 4. finished bale, weighing between 600 and 1000 pounds, is ejected (see Photo 4). Without question, *Dempster Balesters* are the fastest, most efficient presses baling scrap! For complete information clip coupon below and mail to us today. A product of Dempster Brothers, Inc.



DEMPSTER BALESTER

CHECK BELOW INFORMATION DESIRED

- ☐ Dempster-Balester Model "600". Produces 600 to 1000 lb. bales.
- ☐ Dempster-Balester Model "350" (High Speed). Produces 300 to 400 lb. bales.
- ☐ Dempster-Balester Model "275". Produces 300 to 400 lb. bales.
- ☐ Dempster-Balester Model "128" (Portable). Produces 175 lb. bales.

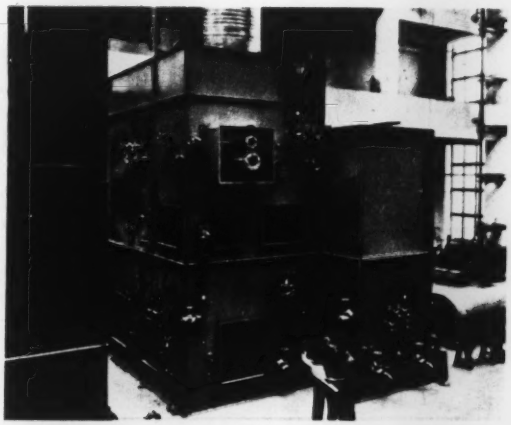
NAME

FIRM

ADDRESS

DEMPSTER BROTHERS, 6102 Dempster Bldg., Knoxville 17, Tennessee

BLAW-KNOX offers tonnage oxygen plants to increase your profits!



A typical Linde-Fraenkl Plant under construction

If you use or sell 10 or more tons of oxygen per day, get the facts and figures on Linde-Fraenkl Process plants now. Chemical Plants Division is experienced in the design, engineering, construction and equipping of units employing this highly efficient process. More than 100 plants are in continuous operation. The investment and operating costs are low. Our engineers will be pleased to discuss the many advantages of producing your own oxygen.

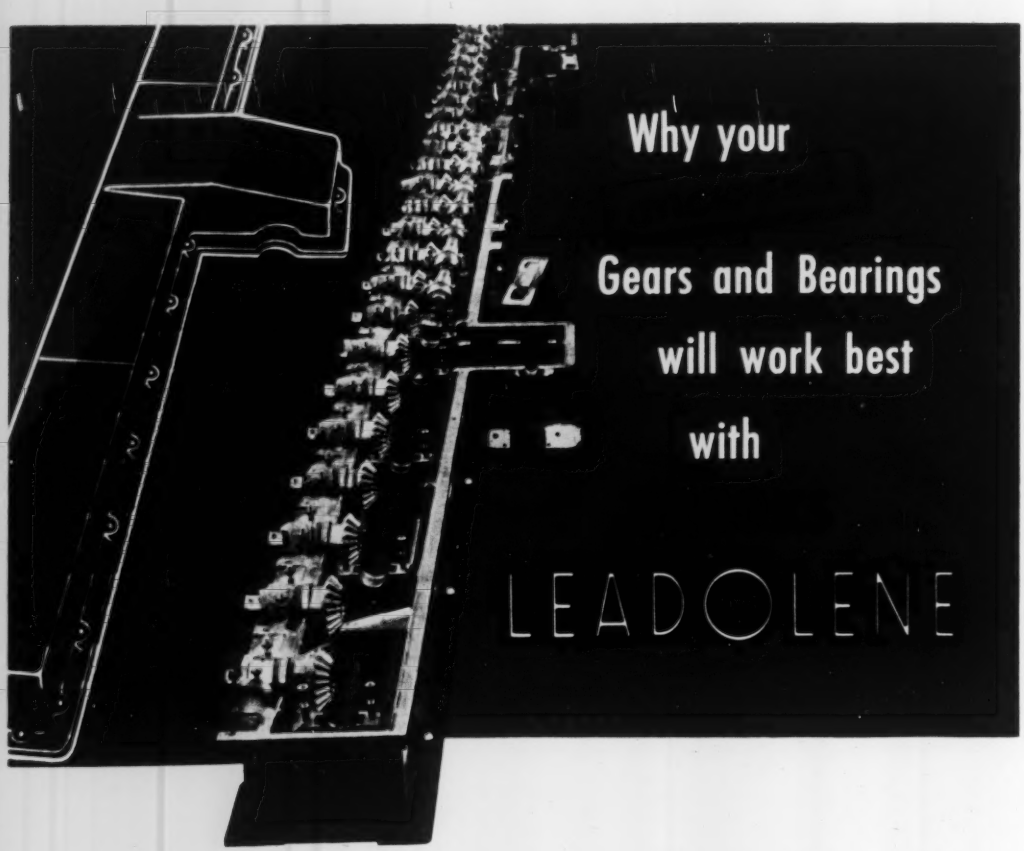
MORE AND MORE OXYGEN USED FOR:

Production of hydrogen from natural gas; of steel in Bessemer and Thomas converters; open hearth and blast furnaces . . . Gasification of coal for the synthesis of ammonia and high BTU gases . . . Production of hydrocarbons.

BLAW-KNOX
CONSTRUCTION COMPANY
CHEMICAL PLANTS DIVISION
930 Duquesne Way, Pittsburgh 22, Pa.

TULSA 1 • NEW YORK 17 • PHILADELPHIA 3 • CHICAGO 1
BIRMINGHAM 3 • WASHINGTON 5, D.C. • SAN FRANCISCO 5

HERE'S COMPLETE DATA. WRITE TODAY ON YOUR LETTERHEAD FOR THIS BULLETIN.



Enclosed gears . . . with their close tolerances, high speeds, shock loads, and great bearing and tooth loads . . . operate best when protected by Brooks LEADOLENE. With its "Indestructible pH-ilm Strength," this lead-based lubricant is definite assurance against pitting, galling, finning of teeth and abnormal bearing wear. The lubricating efficiency of LEADOLENE is not affected by water.

The following case history indicates the kind of service you can expect from LEADOLENE: *"Although a good quality lubricant was used in a certain Cleveland plant's enclosed gear reduction units . . . the gears, bearings and shaft journals required replacement so frequently that the reductions were taken apart every four months. At that time they were cleaned, some replacements were made and new lubricant was added. When LEADOLENE No. 90 was adopted as the lubricant, the reductions were operated for over two years with no replacements and no serious wear."*

For reduction gear sets . . . mill table gear drives . . . or any other enclosed gear application—you will profit by standardizing on Brooks LEADOLENE as your lubricant.

WRITE for the 20-page brochure, "The Brooks Oil Story". . . or for consultation by a Brooks Engineer.

With LEADOLENE you get these characteristics

pH-ilm Strength . . . 30,000 psi minimum.

Adhesiveness . . . Affinity for metal develops maximum adhesion providing permanent coating on gears.

Water Repellence . . . Effectiveness is not reduced by water.

Corrosion Prevention . . . Never acidic and will not etch or corrode.

Compounded Stability . . . Will not bleed or change physical condition within a greater temperature range.

Low Temperature Factors . . . Does not harden, crack or decrease in adhesion.

Abrasive Resistance . . . Repellent to adhesion of scale, metallics and other contamination.

THE BROOKS OIL CO.

Since 1876

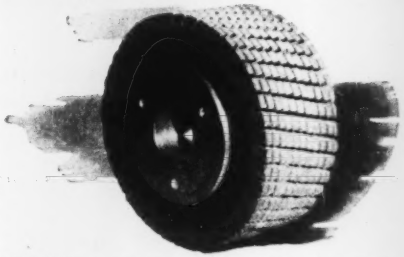
Executive Offices and Plant . . . . . **Cleveland, Ohio**
Executive Sales Offices . . . . . **Pittsburgh, Pa.**
Canadian Offices and Plant . . . . . **Hamilton, Ontario**
Cuban Office . . . . . **Santiago de Cuba**

How would you solve it?

Production problem:

Break a "bottleneck" caused by standard weld-removal methods on cold-rolled steel stator shells

1 Here's what Century Electric Company, Saint Louis, Missouri, did. They turned their weld-removal problem over to a 3M Methods Engineer, who studied the problem with Century Electric specialists and came up with a solution.



2 3M's recommendation was a conversion to backstand equipment with fast-cutting abrasive belts. A specially engineered contact wheel was recommended—plus the right abrasive belt, grit size, and operating speed.

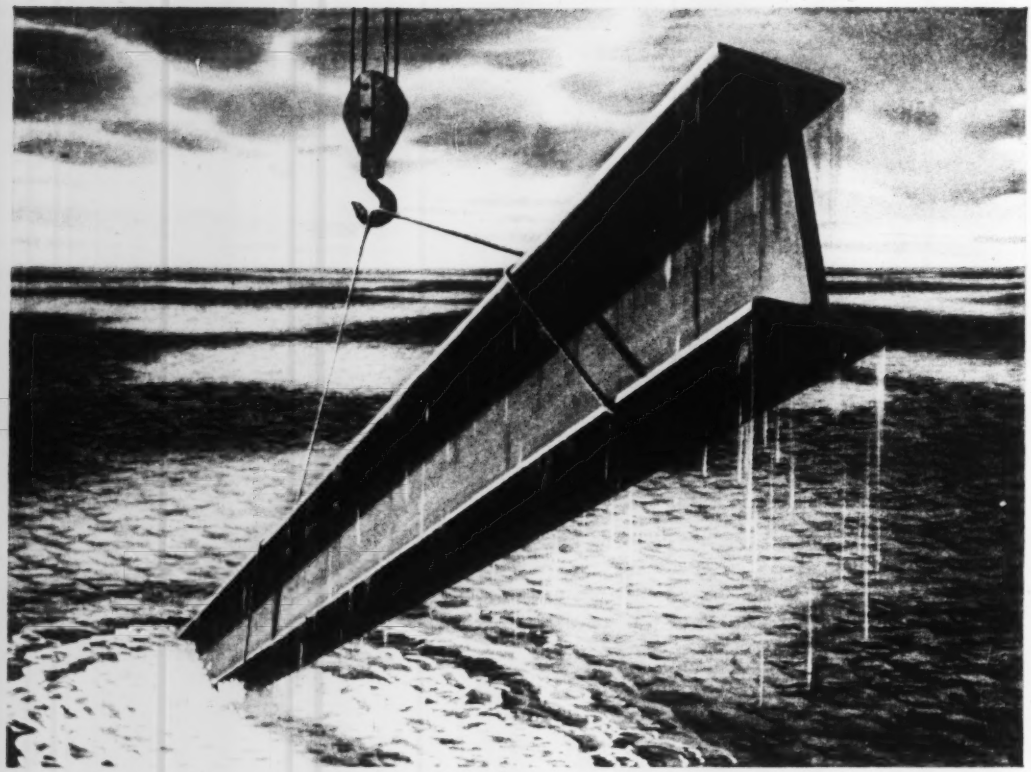
3 Now Century Electric uses the 3M Method to finish stator shells 800% faster than with the previous equipment. Production has jumped from 15 to 125 pieces per hour with smoother finishes too!

4 3M maintains Demonstration Rooms in principal cities throughout the country, where abrasive engineers will demonstrate how you can cut *your* grinding and finishing costs. For additional information on the 3M Method, write for a copy of the "Step UP Production" booklet, Dept. ST-102, Minnesota Mining and Manufacturing Co., St. Paul 6, Minnesota.

FIFTIETH ANNIVERSARY
3M
ABRASIVES
1902 ★ 1952

Made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can., Export: 122 E. 42nd St., New York City.

Makers of "Scotch" ® Brand Pressure-sensitive Tapes • "Scotch" ® Sound Recording Tape • "Underseal" ® Rubberized Coating "Scotchlite" ® Reflective Sheeting • "Safety-Walk" ® Non-slip Surfacing • "3M" ® Abrasives • "3M" ® Adhesives.



Sea water...secret of more steel!

The secret of improved open hearth furnace bottom performance—and increased ingot production for you—is high purity periclase derived from sea water magnesia.

Higher in MgO, lower in impurities, thus sea water *periclase* is the heart of Permanente 165 ramming mix.

Proved superior by many of the industry's most progressive companies, Permanente 165 *retains highest strength at operating temperatures*—gives maximum refractoriness and maximum resistance to chemical attack.

Pre-shrunk for high density, the sea water periclase of patented Permanente 165 is bonded to *full depth* by crystal bridging—a solid phase reaction.

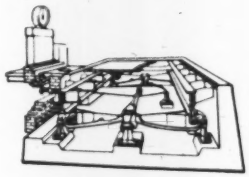
Result: protection from costly breakthroughs, less down-time for repairs between heats, more tonnage per year!

YOUR Kaiser refractory engineer will give prompt attention to your refractory problem—will offer, where desired, research, design and installation service to give you maximum production most economically. Write for descriptive literature on Permanente 165 and on the companion ramming mix, Permanente 84. Principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California; First National Tower, Akron 8, Ohio.

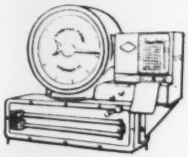
Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

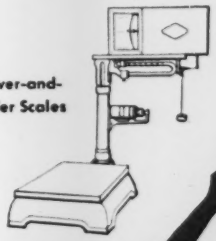


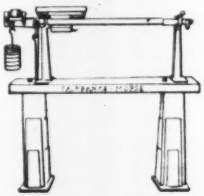
Truck Scales



Printomatic Dial Scales

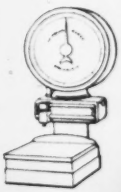
Over-and-
Under Scales



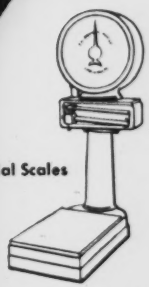


Type Registering Beam Scales

Bench Dial Scales



Portable Dial Scales

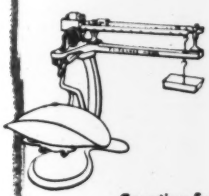


Speeds your weigh!

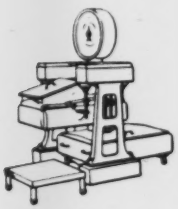
FAIRBANKS-MORSE,

a name worth remembering

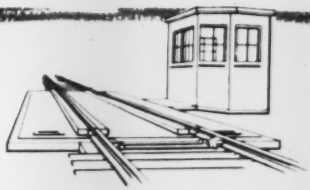
SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS



Counting Scales

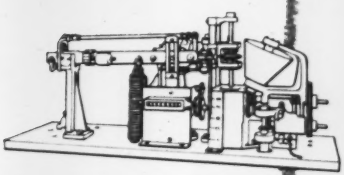


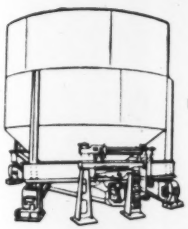
Weigh Can Scales



Railroad Track Scales

Belt Conveyor Scales





Hopper Scales

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois

ABSOLUTE *TOLERANCE* CONTROL

When job specifications leave no leeway, when extreme tolerances must be maintained . . . that's when the built-in precision and absolute tolerance control of Grand Rapids Grinders proves most valuable. Defense commitments make it impossible for us to fill your orders as rapidly as we'd like to . . . but we know our customers can appreciate the reasons for delay. As always, we're doing our best to serve you.

GALLMEYER & LIVINGSTON CO.
307 Straight Ave., Grand Rapids, Mich.

GALLMEYER & LIVINGSTON

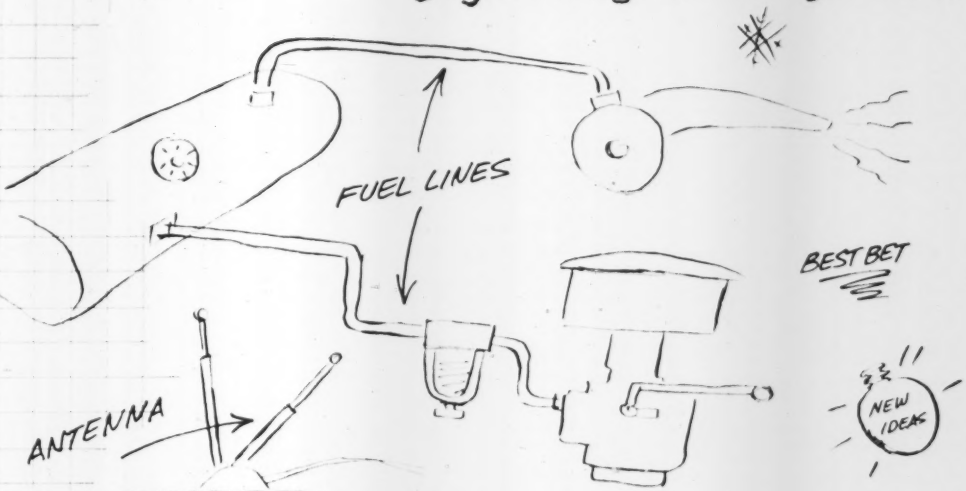
GRAND RAPIDS GRINDERS

... the very best

Manufacturers of
SURFACE GRINDERS • CUTTER and TOOL GRINDERS • TAP and DRILL GRINDERS

Bundyweld "Doodles"

to jog a designer's imagination



Been working out a few new ideas lately? If tubing is a part of them, then Bundyweld is your best bet. Top performance and low fabrication costs make it practical for a wide choice of applications.

Bundy engineers are available for design or fabrication help, too. Backed up by years of experience, they can often point out ways to save you time, material and money. Write for a catalog today.

Bundy Tubing Company, Detroit 14, Michigan.

WRITE

Bundyweld® Tubing

DOUBLE-WALLED FROM A SINGLE STRIP

Leakproof
High thermal conductivity
High bursting strength
High endurance limit
Extra-strong
Shock-resistant
Ductile

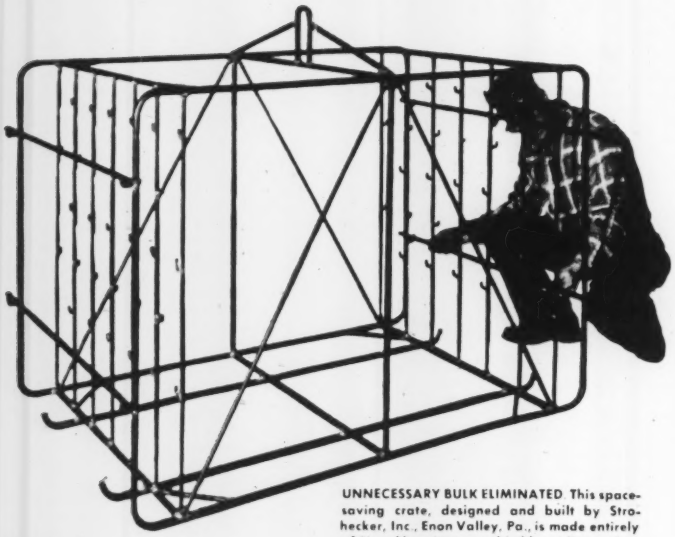
Lightweight
Machines easily
Takes plastic coating
Scale-free
Bright and clean
No inside bead
Uniform O.D., I.D.

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . . continuously rolled twice around laterally into a tube of uniform thickness, and passed through a furnace. Copper coating fuses with steel. Result . . . Bundyweld, double-walled and brazed through 360° of wall contact.

NOTE the exclusive patented Bundyweld beveled edges, which afford a smoother joint, absence of bead and less chance for any leakage.

Bundy Tubing Distributors and Representatives: ***Cambridge, 42, Mass.:*** Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Philadelphia 3, Penn.:*** Rutan & Co., 1717 Sansom St. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 4755 First Ave. South ***Toronto, Ontario, Canada:*** Alloy Metal Sales, Ltd., 181 Fleet St., E. • **Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.**



UNNECESSARY BULK ELIMINATED. This space-saving crate, designed and built by Strohecker, Inc., Enon Valley, Pa., is made entirely of Monel bar. It was welded by ordinary shop methods, using "43" Monel gas welding wire, as recommended by Inco's Technical Service.

This sturdy, all-welded crate

ADDS 50% TO PICKLING TANK CAPACITY

Here's a crate that carries a special message for every user of pickling equipment.

Strohecker, Inc., of Enon Valley, Pa., designed it for a customer who pickles the long, steel reflectors used behind fluorescent lights.

Of welded Monel® construction, the crate weighs only 350 pounds, and safely handles a 1,000-pound load of reflectors. It operates in a sulfuric acid solution of 5 to 10% concentration held at 180 to 200° F.

Thanks to this compact, lightweight crate, Strohecker's customer is now getting a 50% greater payload into his pickling tank—on *every* load. He's saving not only time, but labor, power and acid. And that's only natural—because he's pickling more reflectors (and less crate!) on each trip into the acid.

Check your own equipment today. There's a good chance Monel can help increase the efficiency of your pickling room, too.

For Monel is strong . . . tough . . . long-lasting. It resists hot sulfuric and other pickling acids commonly used in steel mills. It stands the bumps and jolts that fracture less ductile metals.

In addition, Monel offers *workability*. It can be fabricated by ordinary shop methods. And it can be welded—welded so perfectly that the joints have all the strength and corrosion resistance of Monel itself!

Keep Monel in mind. It makes rugged crates and racks . . . hooks and hangers . . . yokes . . . chain . . . pickle bars and accessories. Remember, though, that Monel is on extended delivery because of defense needs. It will pay you to order in advance, and to include NPA rating and complete end-use information.

The booklet, "Where Monel Pays its Way in Pickling," has been specially prepared to show you how useful Monel can be. Write us for your copy—now.

INCO
TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Monel PICKLING EQUIPMENT
extra life
extra capacity
extra safety

October 20, 1952

More Horsepower

General Electric Co. is redesigning its electric motors to double in many cases the horsepower without changing the frame size of the units. GE has osked National Electrical Manufacturers Association to modify its rating standards for motors. If NEMA does change, the effect would be to pressure all motor manufacturers to follow the new ratings. A committee is studying the proposal now and hopes to come up with a decision Nov. 12.

Guesses or Estimates?

How accurate are the government's estimates of industrial expansion goals? Some of them may turn out to be mere guesses. Wire mill people pressed DPA on its seeking a $15 million expansion of capacity. Clarence Blumoehr, chief of NPA's wire mill branch, copper division, explained he was required to submit an estimated expansion goal for 1952, including applications for tax amortization certificates pending from 1951. Since firm estimates of military requirements are unknown, said Mr. Blumoehr, he "guessed" $15 million.

Plateau for Ammunition

A plateau has been reached in the ammunition program requirements. Expect little change for the next two or three quarters. That's good news for brass mills whose business is already at or near capacity. The industry has been plagued by strikes, which are at last clearing up.

Not Enough Bottoms

Deliveries of foreign copper still lag as shipping space continues tight. Forward supplies are being tied up as fast as they are offered. Electrolytic orders can't be filled in less than two months, but fire refined copper is available much sooner.

Power Problems

A power-curtailment plan for the Pacific Northwest will probably start Nov. 1. Commercial and domestic users will not be affected but will be asked to reduce consumption voluntarily. The planned curtailment will cover industries using 8000 or more kilowatt-hours weekly, who will be required to reduce. That will include about 1000 firms, notably aluminum plants.

Research and Titanium

Research projects are in progress to get titanium from ilmenite instead of rutile and magnesium, as is now the case. If studies are successful, a rapid increase in titanium production will be possible (p. 63). That's because ilmenite is readily available in this country, while about half our rutile requirements must be imported, mainly from Australia. Ilmenite would make feasible an eventual titanium

Production-Engineering News—p. 89 The Market Outlook—p. 147

production of about 22,000 tons annually, which DPA envisages. Output will be 1500 tons this year, about 4000 tons in 1953—ilmenite or no ilmenite.

Verdict on Price Controls

Tighe E. Woods will end his tour of the nation's kitchens Oct. 23. Ostensibly, he was on a trip to find how American housewives were making out with price controls. Actually, he was out to appraise the political significance of controls, whether it would be expedient to ease them markedly before the election. His report will advise that controls be kept. Even some recontrol will be tried. The first such action has already been taken. Ceiling prices last week went back on radio, television and phonograph parts just 46 days after they were removed.

Except for Detroit

The unusually tight labor situation that Detroit is experiencing is pretty much confined to that city. Chances are good that available workers will be more plentiful even there sometime early next year. Across the country, the labor supply generally is fairly tight, but no worse than it has been at any time since the Korean war began. In industries such as foundries where many shops are not working a full week, companies are having trouble retaining personnel. They can easily find other jobs.

Straws in the Wind

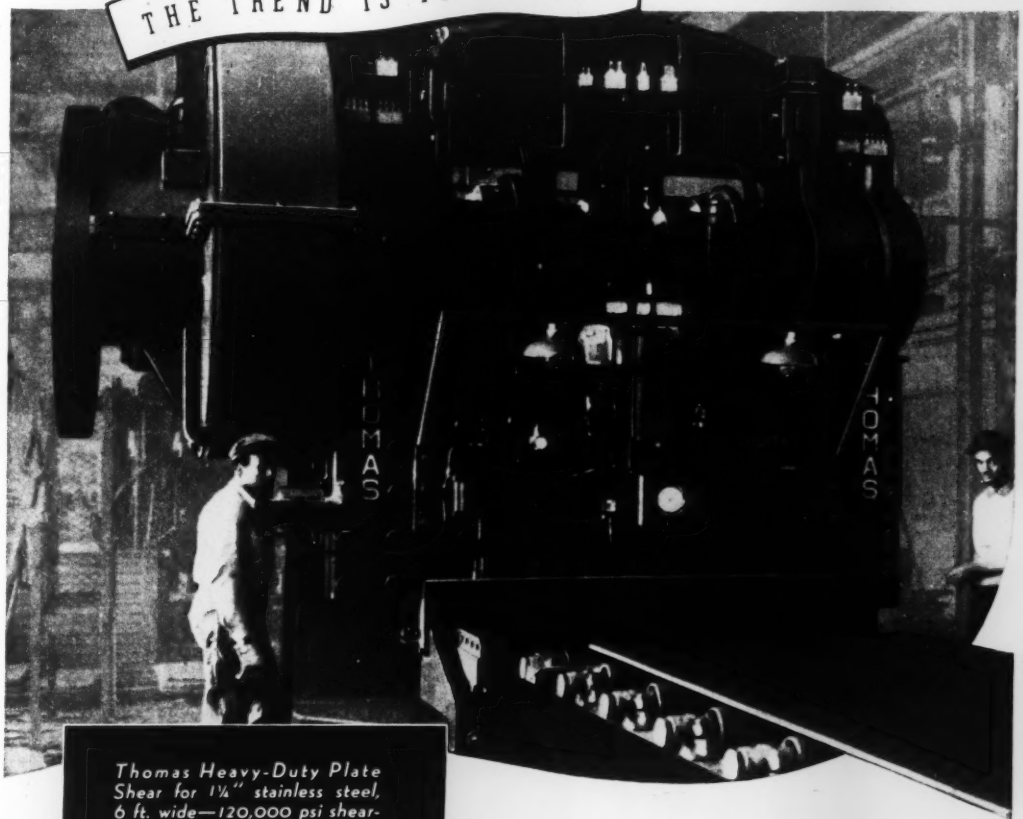
Despite extensive changes, prices on 1953 Dodges will be up to 5 per cent lower than on comparable 1952 models . . . Conspiracy charges in the sale of Williamsport Wire Rope Co. to Bethlehem Steel Corp. in 1937 were cited by Federal Judge Alfred L. Watson in ruling the sale "null and void"; the decision will be appealed . . . World industrial production in manufacturing and mining dropped 2 per cent in the second quarter compared with the first, says the United Nations; the U.S. steel strike was cited as the major factor in the drop, with sagging European production another key . . . Power tools, household goods and "do-it-yourself" products figured prominently in an unprecedented order volume at the National Hardware Show in New York.

What Industry Is Doing

Present snag in steel distribution could mean a real snarl by next February or March (p. 61) . . . Steel output in September was higher than in any previous 30-day month (p. 62) . . . The rough road of defense expansion appears smoother ahead, now the program is past the half-way mark (p. 64) . . . The nation's heavy press program is plodding along (p. 65) . . . Production on the J-65 jet engine bogs down (p. 66) . . . Automatic systems for plant protection have grown rapidly since World War II (p. 72) . . . The borrowed or pilfered tool problem is discussed in STEEL's new "Management Clinic" (p. 73).

THOMAS *specializes in building* HEAVY SHEARS

THE TREND IS TO THOMAS



Thomas Heavy-Duty Plate Shear for 1¼" stainless steel, 6 ft. wide—120,000 psi shearing strength. Installed in the mills of the Eastern Stainless Steel Co., Baltimore, Md.

This is another example of Thomas' ability in designing and building machines to meet specialized shearing requirements for heavy mill service!

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

32

designed to save manpower and reduce upkeep costs

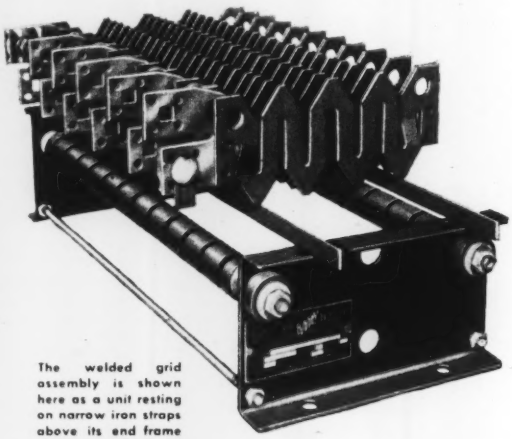
The welded GRID-ASSEMBLY steps up resistor-performance these 3 ways:

1-STABILIZES the ohmic value, independent of the clamping-nuts.

2-STOPS BURNING at grid-eyes and at tap-plates.

3-SIMPLIFIES tap-shifting, when adjusting resistance for best motor operation — also makes it easier to replace sections.

For reduced maintenance where maintenance can be easily overlooked, switch to EC&M Tab-Weld PLATE RESISTORS.



The welded grid assembly is shown here as a unit resting on narrow iron straps above its end frame support rods, and spacers.

SPECIFY BULLETIN **942** EC&M TAB-WELD RESISTORS

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

Sinister Monopoly

"Why I Had To Resign as National Defense Mobilizer," written by Charles E. Wilson for the Committee for Constitutional Government, should be "must" reading for all thoughtful Americans. It warns of a sinister monopoly.

Here is Mr. Wilson's explanation of why he quit: "The President of the United States agreed to a plan to settle the controversy in the steel industry. He knew, and told me, that it was a just solution, that was the best possible for all concerned, and 'all concerned,' mind you, were not just the workers in the steel industry nor the management and shareholders of that industry. Included were all the people of this country; yes, even the troops on the battle-lines in Korea.

"But that solution did not happen to give all that was wanted to one single man, this man who is able to ride roughshod over the President and the people. And he did just that. I could no longer tolerate the atmosphere that permitted so brazenly selfish an act—an act opposed to the government's own plans to sustain the economy of the country in a time of national peril, and I resigned."

Mr. Wilson describes this "single man" as one "who was never elected or appointed to national office, but a man who exercises more control over the country than the President, the Congress we elected, and the officers appointed under the government." The man, of course, is Philip Murray. One must admit that Mr. Wilson's appraisal of his power is not exaggerated.

However, Mr. Murray is not the only person who can dictate to the government. Only last week, John L. Lewis, in refusing to talk with Wage Stabilizer Archibald Cox about his recent wage agreement with coal operators, virtually told the United States government to jump into the lake.

Concentration of too much power in business is bad. Fifty years ago big trusts were broken up. Too much power in union leaders is equally bad. Their strangle hold on government must be broken. A crusade pointed toward that objective should rate high priority on our list of "important things to do."

E. C. Shaner

EDITOR-IN-CHIEF

OUR PAPA AND MAMMA: We do not know too much about the Council of State Chambers of Commerce, but we are favorably impressed by the crusade it is waging against asinine spending by the federal government. A recent bulletin lists a few absurdities.

In a 32-page booklet entitled "Tools for Food Preparation and Dishwashing," the bureaucrats of the Department of Agriculture come up with the astounding fact that housewives should have a dishpan and that it should be "large enough to accommodate your dishes, but it

must also fit into your sink, if that is where you use it." You can get this priceless gem of information for a mere dime, but the cost of producing it far exceeds the revenue that will be derived from purchasers. As taxpayers, we foot the bill for the deficit.

Did you or anybody else ask Uncle Sam to advise you on the subject of dishpans? No. The idea was cooked up by a bureaucrat who thinks that Washington should be papa, mamma and Santa Claus to everybody.

SPOTTY BELOW SURFACE: Although activity in the metalworking industry in general continues at a high rate, there are increasing signs of spottiness. Surface indications are bright. Steel output is exceeding 2 million tons a week (p. 79), automobile assemblies are high in spite of model change-overs, and revenue freight car loadings and electric power generation continue strong.

Nevertheless, activity in some sections of the industry is leveling off. This is noticeably true in certain foundries and forge shops. The easing is attributed to several factors. One is the restraining influence of materials controls. Another is a cautious attitude on the part of many customers in regard to inventories. Another — and a vexing one — is the stretchout in defense activity. The moving back of delivery dates in some cases has caused some suppliers to cut to three and four-day work weeks, even though their order backlogs are substantial. It's a queer and largely artificial condition.

FOR UNION DEMOCRACY: It is so easy to find fault with certain labor union policies that seem to be bad that it is a pleasant relief to discuss something that honestly can be commended.

We read in the newspapers that the CIO Oil Workers Union is conducting an unusual experiment. This union and the Carnegie Foundation have provided a fund to employ the University of Chicago Industrial Relations Center to conduct a poll among union members. Each member is asked to answer 70 questions relating to employment, economic, political and social problems. Members do not have to sign their names to the questionnaires. On the basis of the information available the prospect looks like a sincere effort to promote union democracy.

This is all to the good. Unions would help themselves tremendously if they could get away from coercion, strong-arm stuff and similar tactics.

SOMETHING FOR NOTHING: In many metalworking plants the loss of small tools through careless "borrowing" or even downright pilfering has become something of a problem. Management is forced to take measures to keep losses due to missing tools to a minimum and yet it doesn't want to act in a way that will reflect adversely upon the great majority of employees who are honest.

One manufacturer who comments on this problem (p. 73) believes "that there is little appealing to a worker's sense of honesty when it has been corrupted by the 'getting something for nothing' philosophy of our times." This is a well-founded and highly provocative statement. It is quite likely that the "something for nothing" idea has caused people in many walks of life to condone behavior that wouldn't have been tolerated several decades ago. Elevating humanity to a higher standard of integrity is a world-wide problem.

A REAL ACHIEVEMENT: Cinder pots play an important if not conspicuous role in the making of iron and steel. They carry molten slag from open-hearth and blast furnaces at temperatures above the melting point of iron and steel. They do this without heat resistant linings. Also, in spite of more exacting operating requirements (p. 90), today's cinder pots last longer than their predecessors.

Reasons for this longer life are better design and improved "housekeeping" in the handling and maintenance of the pots. Without the advantages of these improvements, the operation of open-hearth and blast furnaces at over their rated capacities over extended periods of time would be difficult if not impossible. To increase pot life while contending with the greater punishment of today's requirements is a real achievement.

talk about MULTI-PURPOSE

this KLING is really the "jack-of-all-jobs"

When you were a boy, your ambition was to have one of those jack-knives with over a half-a-dozen blades that would do everything. Right now, wouldn't you like to have such an all-purpose machine in your shop?

Here it is! The Kling Combination Shear, Punch and Coper that handles all the different operations shown above and many more. One of these Kling Machines in your shop can turn out the work of a separate punch, angle shear, bar shear, plate shear or notcher — and yet it costs only a few dollars more than a single-purpose punch.

For increased speed and safety, each end operates independently. Foot pedals allow both operators to keep hands free to hold work.

On all kinds of metal-fabricating jobs this Kling Combination will speed up your production, save man-hours and make money for you. Available in 3 sizes for light, medium or heavy work; all ruggedly built, and all meeting machine tool precision standards.

SEND FOR FREE BULLETIN that gives you complete details of all the jobs this machine can do; full technical data and specifications. Ask for Bulletin 347. Kling Bros. Engineering Works. 1324 North Kostner Avenue, Chicago 51, Illinois.

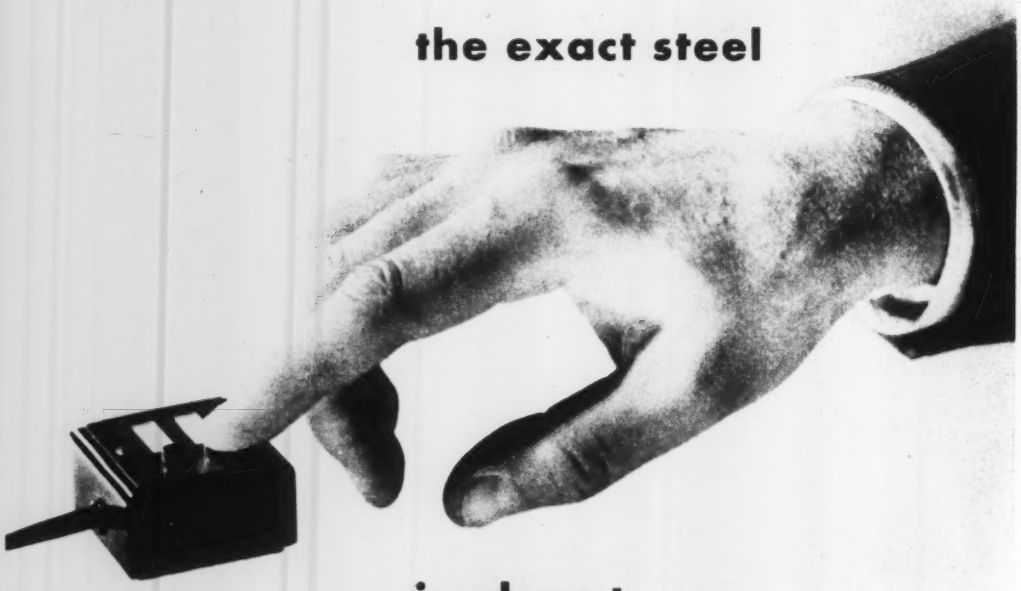
60th Year

Kling

...an investment in speed!

selecting

the exact steel



is almost

this easy!

The age of push-button steelmaking has not yet arrived. But many a steel buyer has learned that a buzz to his secretary is the first step in making contact with a team of steel experts who can put their special knowledge and skills to work making the *right* steel to do the job. We have this team at Inland.

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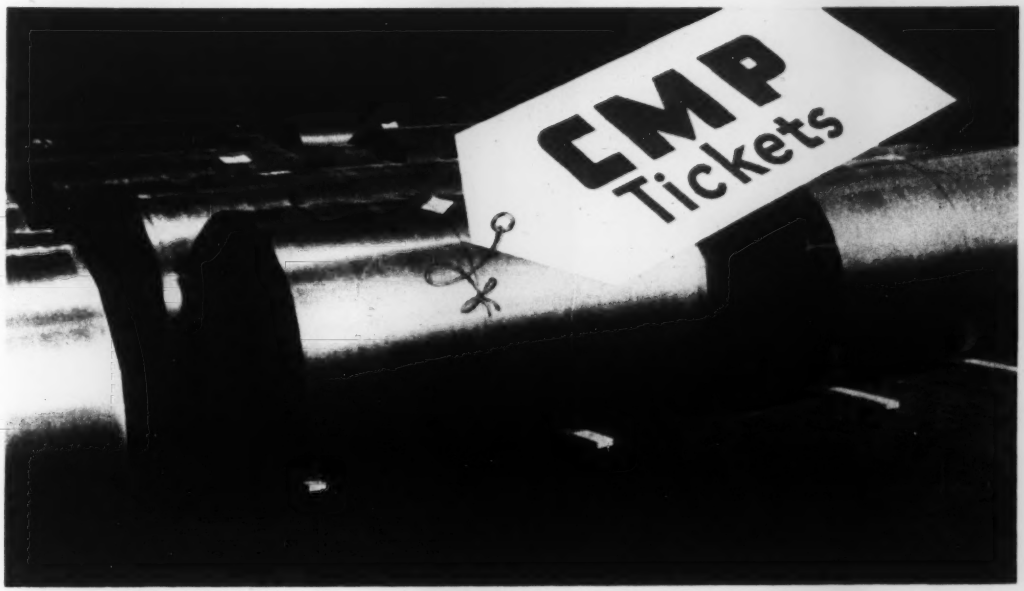


...Do They Match Supply?

Automakers raise the question as a distribution tangle arises despite rising steel production. NPA may have underestimated output and issued too few CMP tickets

A SNAG has developed in steel distribution plans that could mean a snarl by next February or March.

Automakers are talking the loudest about it (see p. 75 for details), and at truck and auto industry advisory meetings in Washington Oct. 27 and 28 they will present their formal charges.

Chain of Events—What has happened is this: Most automakers will have used up all their third and fourth quarter tickets by the end of this year. That's a surprise because NPA figured that the steel strike had delayed all deliveries on third and fourth quarter steel to such an extent that a substantial portion (some planners estimated about 10 million tons of finished) would be carried over from third and fourth quarter allotments to the first period of 1953. Using those calculations, officials cut first quarter allocations on automobiles and other consumer durable goods to about 60 per cent of the third quarter, figuring that the carryover would help make up the balance.

But lo and behold, the auto industry will have no carryover of steel tickets and may find that its production next January, February and March will be some 40 per cent below what it is running now. Spot checks by STEEL reveal that the auto industry probably is alone in this situation. A handful of large firms in other industries have also been able to cash all their current tickets when they're due, but no other industry as a whole has been able to do what motordom has done.

In Fact—Aside from automotive suppliers and assemblers, the steel supply situation for metalworking companies is about as anticipated just after the steel strike ended—getting a little easier, but still tight. Bars are in the worst shape. If it weren't for the puzzle from Detroit, original carryover estimates would probably hold in fact.

But they aren't holding. Why? Two explanations may account for the paradox: NPA has underestimated steel production and hasn't issued enough tickets, or high pressure buyers from auto companies have been able to persuade steel companies to give them preferential treatment. A combination of both may be causing the trouble.

Solutions?—Something has to be done, whatever the cause of the dilemma. Steelmen believe the situation reflects a tangle in red tape and distribution not a snafu in production. A new record of 2.2 million tons of ingots were turned out in the week ended Oct. 18, the third

Pratt & Whitney Cited

A National Award of the American Legion goes to Pratt & Whitney Aircraft, East Hartford, Conn., in recognition of their placement program for workers regarded as handicapped. At the right, above, is Stanley Piecharczyk, who lost his left hand during World War II. Now leadman in Pratt & Whitney's plating department at North Haven, Conn., he checks a plating job with Ugo Tontini, a co-worker

in which output highs have tumbled.

One solution may be an increased use of foreign and conversion steel which is not charged against CMP. Yet, there's an early limit to the amount of that metal available, and the prices are too high for many consumers. So, from Washington will have to come most of the help.

Tangled Tape—The Steel Task group met there last Monday and discussion produced "advice, but no solutions." The Steel Decontrol Committee and the Steel Products Industry Advisory Committee will meet in Washington later this month to discuss the problem too. But it looks as if the whole ball of tangled red tape will be dumped into the lap of Henry H. Fowler, Defense Mobilization director, when he returns from a two week trip to Europe starting early in November.

Officials say this delay won't matter much because available tickets would permit scheduled production through January and February with the first real danger of a cut-off coming in March, but some automakers say they'll be short of steel before the end of December. So the avowed DPA position of watching and waiting may have to be abandoned under automaker assault.

Possible Answers—If Mr. Fowler goes to Europe anyway, here are some of the alternatives he can mull over:

1. He could open-end CMP, allowing manufacturers to place orders ex allotment at the expiration of leadtime if any open space shows up on mill schedules.

2. He might remove forms and shapes in adequate supply from CMP. This practice was followed in the past in some cases, but it's no longer considered advisable because of difficulties in stating requirements.

3. He could allow all manufacturers to buy steel within stated limits without CMP tickets.

4. He might issue more tickets with a proviso that uncashed fourth quarter and first quarter advance allotments be given a priority.

5. He could force manufacturers to live within their current allotments through scheduling production if need be. This unsavory alternative would bring the books into balance quickly, be highly unpopular with industry.

The urgency of the situation demands a decision, probably more quickly than officials admit. But the problem, though urgent, should be short-lived. Opinion is that the second quarter will find flows of steel returning to normal. However, that won't mean an early end for controls. Uncertainty of copper and aluminum supplies will keep a roof over the head of controllers at least through the second quarter.

Copper Outlook Darkens

Copper is not in plentiful supply now and no immediate improvement is foreseen. That's the consensus of the Wire & Cable Industry Advisory Committee and of National Production Authority.

"Although the fourth-quarter supply-demand figures balance on paper, the supply estimates are optimistic," says Paul R. Andrews, director, Copper Division, NPA.

Steel Production Sets Record in September

STEEL production in September was higher than in any previous 30-day month. Output totaled 9,031,000 net tons, says the American Iron & Steel Institute.

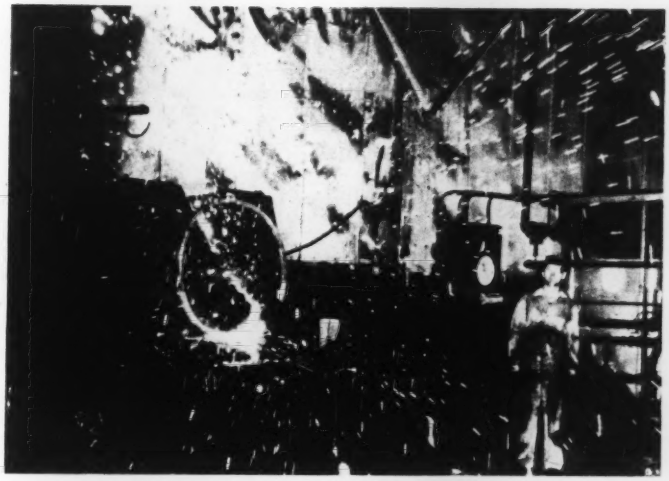
In attaining that tonnage, production of steel for ingots and castings reached 101.6 per cent of rated capacity.

The September output was the largest since March. Additional details are shown in the table.

	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	No. of weeks in mos.
1952	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity		
January	8,103,123	100.7	407,298	89.3	625,696	89.7	9,136,117	99.3	2,062,329	4.43
February	7,703,066	102.4	382,712	89.8	571,432	87.6	8,657,210	100.7	2,091,114	4.14
March	8,401,140	104.4	378,861	83.1	624,190	89.5	9,404,191	102.2	2,122,842	4.43
1st Qtr	24,207,329	102.5	1,168,871	87.4	1,821,318	89.0	27,197,518	100.7	2,092,117	13.00
April	7,101,199	91.1	373,006	73.2	566,937	83.9	7,991,142	89.7	1,862,737	4.29
May	7,291,865	93.6	318,642	69.9	594,089	85.2	8,204,596	89.2	1,852,053	4.43
June	1,448,927	18.6	22,862	5.2	169,702	25.1	1,639,491	18.4	382,166	4.29
2nd Qtr	15,839,991	67.0	664,510	49.6	1,330,728	65.0	17,835,229	66.0	1,370,886	13.01
1st 6 Mos	40,047,320	84.8	1,833,381	68.5	3,152,046	77.0	45,032,747	83.4	1,731,363	26.01
July	1,347,587	16.8	2,000	0.4	277,371	39.8	1,626,958	17.7	368,090	4.42
August	7,599,888	94.4	309,361	67.8	579,438	84.5	8,498,687	92.4	1,918,440	4.43
September	8,051,000	103.0	352,000	79.9	671,000	99.6	9,034,000	101.6	2,111,000	4.28
3rd Qtr.	16,958,475	71.1	663,361	49.1	1,527,809	74.4	19,159,645	70.3	1,459,227	13.13
9 Mos	57,005,795	80.2	2,496,742	62.0	4,689,855	76.1	64,192,392	79.0	1,640,071	39.14
1951										
September	7,653,801	102.4	404,726	87.7	601,830	97.0	8,660,357	101.2	2,023,448	4.28
3rd Qtr.	23,054,844	100.5	1,253,147	88.5	1,775,956	93.4	26,083,947	99.4	1,986,592	13.13
9 Mos	69,501,122	102.0	3,624,033	86.2	5,262,777	93.1	78,387,932	100.5	2,009,947	39.00

Note—The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings; total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons. The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer, 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons, based on annual capacities as of Jan. 1, 1951, as follows: Open-hearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons; total 104,229,650 net tons.

† Preliminary figures, subject to revision.



FLASH BUTT WELDING TITANIUM AT AMERICAN WELDING
. . . rush is on for ways to handle this flourishing middleweight metal

Titanium: Middleweight Metal Grows Up

New member of the metals family shows an amazing development as industry tackles problems of cheaper refining and DPA raises its production goal

TITANIUM and its alloys are experiencing growing pains of all infants, but remarkable progress is being made in refining and fabricating processes for the metal.

One thousand interested godfathers attended the titanium symposium, Watertown, Mass., arsenal, Oct. 8, and several hundred applications were turned down for lack of facilities.

Retarding Growth—Cost is the chief stumbling block in refining titanium ore. Once the price was $20 a pound for refined sponge titanium, compared with the two cents a pound market price for the ore. Now the price is $5 a pound but still too high for projected mass applications of the metal.

Ingot size is steadily increasing; one-ton ingots are being produced this year with at least one producer aiming for a two-ton ingot in 1953. At current high prices, likely to be lower as production increases, dollar sales for 1953 are expected to approach $150 million. Approximately 1500 ingot tons will be produced this year with indications that 4000 tons will be melted for finished products in 1953. In 1950 only 60 tons of the metal were refined.

Bigger Diet — To meet short-term requirements, Defense Production Administration has fixed a new titanium production goal of 22,000 tons. New companies may be urged to enter the field. Mobilization officials believe the metal is too expensive and too hard to handle to warrant stockpiling at this time.

The goal was fixed lower than recommended by the military which is interested in the use of titanium as a skin for airplanes and in some jet engine applications. If the 40-odd laboratories which are now looking for better ways of producing sponge titanium succeed, you can look for a further hike in production goals.

Planned Activity—Declaring that Crane Co., for one, is "on the crossroads of large scale titanium production," J. L. Holloway, president of Crane, states the plumbing supply firm will probably invest $3 million of its own funds in a titanium plant even if government aid is not extended. He adds, however, that the over-all extent of output would depend largely on government decisions.

Besides the aircraft industry, titanium is used in base plates for 81 mm mortars, field gun mounts and muzzle shields, recoil cylinders, armor plate and extruded parts for smaller arms. Many new applications are anticipated when price and production of the refined metal allows. These teething troubles can be expected for five years or more. Considering titanium's new product potential, the metal seems to fill the void between aluminum and steel. But there are numerous unestablished properties for design engineers to consider before going whole hog.

In any event the infant, titanium, has had an amazing growth thus far and appears destined to become the middleweight champion of metals.

Ryan Has Titanium Contract

Ryan Aeronautical Co., San Diego, Calif., launched into titanium research to determine the best methods of processing the metal for use in exhaust systems under a recent contract from the Air Force.

Ryan began research on titanium at its own expense in August, 1951, and was one of the first companies to form this metal successfully by the drop hammer process. Ryan has also explored the use of ceramic coatings on titanium to determine whether these may provide protection against oxidation and absorption.

The contract awarded to Ryan is part of the Air Force's projected $5 million program to explore and stimulate uses of the vital metal.

No Decontrol of Tool Steels

The Tool Steel Industry Advisory Committee went on record last week as recommending removal of controls on the use of tungsten in the production of high-speed tool steels and removal of controls on distribution of tool steels. NPA officials countered that as long as tungsten was being stockpiled and to maintain the balance of demand between tool steels and other types, controls could not be removed.

DEFENSE EXPANSION PASSES MIDWAY POINT

As Covered by 11,052 Certificates of Necessity Issued Through June 30, 1952 for Construction, Machinery and Equipment

PROGRAM	Reported Cost (Thousands of dollars)	(In Place)(EST.) (Thousands of dollars)	Per Cent
Natural Gas Trans. & Distribution	221,332	221,260	100
Pharmaceutical Preparations	62,892	59,230	94
Railroad, Line-haul Operating	2,534,083	2,101,995	83
Hydraulic Cement	106,739	85,254	80
Compressed & Liquefied Gases	110,319	84,713	77
Aircraft	203,861	156,433	77
Aircraft Parts & Aux. Equip.	175,318	130,070	74
Natural Gasoline	207,325	146,603	71
Great Lakes Transportation	158,675	108,762	69
Electrical Machinery	356,250	242,005	68
Aircraft Engines and Parts	495,838	326,561	66
Steel Works & Rolling Mills	2,308,413	1,500,252	65
Machinery, Except Electrical	635,128	413,761	65
Electrometallurgical Products	204,604	132,110	65
Alkalies and Chlorine	293,089	187,636	64
Primary Refining-Aluminum	700,100	383,596	55
Pulp Mills	314,745	172,119	55
By-Products Coke Ovens	198,344	107,919	54
Petroleum Pipelines	571,241	301,467	53
Electric Light & Power	3,077,799	1,477,436	48
Industrial Organic Chemicals	608,972	289,811	48
Synthetic Fibers	172,065	77,809	45
Welded and Heavy Riveted Pipe	204,455	89,383	44
Paper and Board Mills	364,314	152,145	42
Petroleum Refining	1,276,967	518,020	41
Plastics Materials	198,830	69,106	35
Industrial Inorganic Chemicals	815,679	264,690	32
Blast Furnaces	699,208	179,640	26
Iron Ores	794,994	183,803	23
Copper Ores	124,620	20,849	17
All Other	3,029,476	1,960,772	65
GRAND TOTAL	21,225,675	12,145,210	57

GRAND TOTAL COMPLETED AS OF SEPTEMBER 30, 1952 → **57%**

New Schedules Push Expansion Forward

Plant and equipment expansions aided by fast tax write offs have fallen behind schedules through lack of steel and certain tools. Road ahead looks smoother

THE ROUGH road of defense expansion looks smoother ahead as the program passes the half-way mark. With 57 per cent of expanded facilities in place (see above), the current timetable calls for 83 per cent completion by the end of 1953, 94 per cent completion by mid-1954 and virtually 100 per cent completion by yearend.

Impeding the program has been a lack of steel, particularly structurals, and delays in getting machinery and equipment. The more widespread difficulties have been encountered in the latter category.

Stumbling Blocks — Among the hard-to-get items were pipe, cranes, presses, drills, boring mills, milling machines, lathes, grinders, pumps, compressors, conveyors, spot welders, turbines, generators, transformers, cable and switch gear.

Fastest rate of expansion during the third quarter was scheduled for alkalies and chlorine, synthetic fibers, electrometallurgical products, aluminum refining, welded and heavy riveted pipe, electrical machinery, petroleum pipelines, electric light and power and natural gasoline. Largest dollar value of projects not started as of the end of the second quarter was in railroad line equipment and petroleum refining.

End in Sight—Expansions presently scheduled to be virtually complete by mid-1954 include pulp mills, synthetic fibers, industrial inorganic chemicals, petroleum refining, by-product coke ovens, blast furnaces, welded and heavy riveted pipe, non-electrical machinery, aircraft and aircraft engines and parts and Great Lakes transportation.

With better steel supply, chances are good that current schedules will be maintained.

J&L Increases Production

Jones & Laughlin Steel Corp.'s $59 million improvement program nearing completion at its Otis Works in Cleveland includes: A 1300-ton blast furnace blown-in Apr. 29; two 210-ton open hearths making a total of 11; and additional soaking pits.

Capacity of the United 77-inch hot strip mill is increased to 100 of the 9000-pound coils per hour while the United three-stand tandem cold strip mill has been speeded and equipped with uncoiling and coiling equipment to handle coils up to 60,000 pounds in weight. The Mesta sheet temper mill has been modernized by adding equipment for handling these large coils. Other additions include a new Wean pickling line and a Wean shear line for sheets.

Capacity of the plant now is 1885 tons of pig iron and 3429 tons of steel ingots daily with finished steel capacity of 775,000 tons of sheets, strip and plates annually.

Heavy Press Program Plods Along

First phase of the Air Force's heavy press program calls for 30,000 tons of large forgings. Nearly half of these are now on order, but it's a long way from having presses

ABOUT one-half of the 30,000 tons of forgings required for the first phase of the Air Force's heavy press program are now on order or will be soon and the other half will be spread over the next six months. These heavy forgings have been the big hitch in the entire heavy press program's struggle to get going.

The forgings, plus about 25,000 tons annually of die blocks, are required to take care of the 17 large presses now more or less under procurement. Eight of the presses are forging presses from 25,000 tons to 50,000 tons capacity and the remainder are extrusion presses ranging from 8000 tons to 20,000 tons. Forging requirements for the heavy support, trim and straightening presses are not included in the 30,000 tons of forgings noted above.

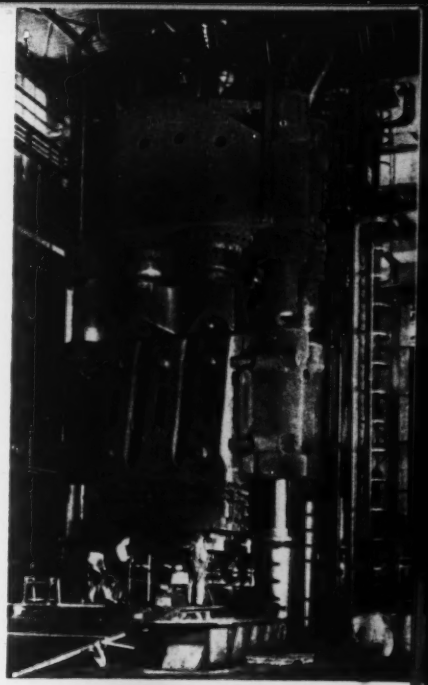
Birds in the Hand—Air Force officials now believe the $389 million on hand for the first phase of the program will be sufficient to complete that job including facilities. In addition, they believe they have sufficient funds to build one more 25,000-ton extrusion press and one 75,000-ton forging press. Both of these have been designed but are not under procurement.

Design of these heavy presses is a foreign matter to most American producers. In fact, German presses discovered after World War II form the basic design pattern for most of the presses in the current U. S. program. The Air Force does not plan to let any additional contracts until the 17 presses now on order (STEEL, Apr. 7, p. 87) are completed and prove out in operation.

Big Press Problems To Be Aired

A new problem is to be presented to the die block industry at a conference to be held by the Air Force at Wright-Patterson Field in the near future.

It will involve the die blocks for the big forging presses now being built for the Air Force. At the start, die blocks of conventional size—that is, 30,000 pounds and less—will be used. But to get maximum production from the giant presses, larger die blocks will have to be used in the course of time. What metallurgical specifications are necessary to produce sound die blocks in the larger sizes? What heat treating procedure will be necessary; will a substitute for the usual water-quenching operation have to be evolved? These are some of the questions requiring answers. It is estimated that die block requirements of these heavy presses will come to at least 25,000 tons a year.



PROTOTYPE FOR HEAVY PRESSES
. . . this German unit helped U. S.

Mining Machinery Steel Asked

Producers of mining machinery are receiving unfair treatment under the 30-day restrictions on steel inventories. So says the Mining Machinery Advisory Committee, pointing out that mills often deliver a 90 to 110-day supply of an individual steel item in one shipment.

The committee told the National Production Authority that requests for inventory exception on an item-for-item basis are also unrealistic. Mining machinery companies must stock from 2000 to 6000 different steel items. It is impossible for these manufacturers to obtain relief on this basis. Committee members suggested that NPA handle appeals on a company wide basis.

The committee also recommended that NPA establish a new Metals, Minerals & Mining Bureau. This bureau would include the NPA's Metals & Minerals Bureau and Mining Machinery Division along with the Requirements Division, Defense Materials Procurement Agency.

Mining machinery companies must have a priority standing on a par with the military and defense industries to expand mineral production in line with the Paley Report, says the committee.

$5 Billion Boom in Chemicals

Anticipated expansion of $5 billion in the chemical industry from 1951 through 1955 means more business for metalworking.

During the past 25 years, chemical production has expanded at an average rate of 10 per cent a year, compared with a growth of 3 per cent for all industry. Chemicals are engaged in a greater expansion program than any other industry except steel.

Currently the Chemical Division of the National Production Authority has acted on about 1250 applications for rapid tax amortizations. Of this number 789 have been certified and 96 are still pending. Certificates issued are for facilities valued at $2362 million.

Of 56 goals established for expansion, sufficient rapid tax amortization has been planned to meet 37 in full, leaving only 19 goals to be met. Goals are established on the basis of partial mobilization needs.

Range Finders Require Rigid Inspection

U. S. Army Ordnance Corps inspectors must have keen vision during finel accept ance of optical assemblies such as this range finder shown at Northrop Aircraft Inc.'s Ancheim, Calif., division. Inspectors like J. P. Wood, above, test optical products before they are crated and sent to the Detroit Arsenal for installation in M-47 tanks. Further tests include submerging in water to insure sealing

Sapphire Jet: Production Schedules Grounded

PRODUCTION of the J-65, Sapphire jet, is still creating a storm on both sides of the Potomac. The Buick Motor Company has now managed to produce two of the controversial engines and is expected to have about 20 ready when 150-hour tests are completed. Buick ranks only as a secondary supplier.

Curtiss-Wright, scheduled by the Air Force to be the principal supplier of the engine part tooling is not yet and it will be some months before production lines are rolling. The Air Force has said that both the contractor and its own staff were "over-optimistic" in fixing the production schedules.

Turned Down—This led to a recommendation some months ago by William L. Campbell, acting chairman of the Aircraft Production Board, to abandon the J-65. However, Mr. Campbell lost that battle and Defense Secretary Lovett sent production expeditor Hugh Dean to Curtiss Wright to see if the snafu could be untangled.

Mr. Dean is reported to have found Curtiss-Wright loaded with other work and not yet ready for the J-65. He is said to have recommended that part of the load be shifted to Buick whose achievement he is said to look on "with pardonable pride", in view of his former connections with General Motors as a production vice president.

Stalled—Under-Secretary for the Air Force Roswell L. Gilpatric denies that there is any plan afoot to take a part of the load from Curtiss-Wright. He adds however that if the production stalemate continues part of the order will have to be shifted. However, Buick is a licensee of Curtiss-Wright which had the original contract. If engineering changes are made, it would be stalled until the changes cleared through Curtiss-Wright. The engine is designed for two of the new planes now programmed and no alternate power plant is available at this time.

Small Plants Get Loan Aid

Since last April Small Defense Plants Administration has approved 189 loans for a total of $22.39 million.

The agency has also issued 41 certificates of competency to defense contract bidders, in addition to approving the loans which will be advanced by RFC out of a special $100 million small defense plants fund, or its regular fund.

The competency certificates guarantee to defense agencies that the bidder will perform satisfactorily on the contract. They are usually appealed for by small manufacturers whose ability to deliver is questioned by purchasing agencies of the government.

In the joint determination phase of the aid program, the agency after conferring with military procurement departments, has arranged for 196 contracts to small business totaling $108.9 million. Twenty-four of these contracts which reach a total of 140 concerns for products valued at $28 million have already been awarded.

Gray Iron Founders Meet

Gray Iron Founder's Society held its annual meeting in Cleveland last week with more than 400 members of the nation's industry attending.

During the two-day meeting speeches were heard from Carl Taylor, president of the Waukesha State Bank, Waukesha, Wis., Dr. G. W. Taylor, professor of labor relations, University of Pennsylvania, W. T. Bean Jr., research consultant, Detroit, A. J. McDonald, chief, Ferrous Castings Section, NPA, and J. M. Price, chief, Castings & Forging Section, Office of Price Stabilization.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Shells, 105 mm	Donovan Inc., St. Paul
Mortar Shells, 81 mm	Modine Mfg. Co., Racine, Wis.
Parts for Tanks	Continental Motors Corp., Muskegon, Mich.
Aircraft Parts (15 Contracts)	United Aircraft Corp., E. Hartford, Conn.
Fuel Controller Parts	Westinghouse Electric Corp., Pittsburgh
Bomb Controls	Magnavox Co., Ft. Wayne, Ind.
Oil Coolers	Standard-Thompson Corp., Dayton, O.
Parts for Diesel Engines	American Locomotive Co., New York
Fire Control Equipment	Fairbanks, Morse & Co., New York
Hospital Beds	Arma Corp., Brooklyn, N. Y.
	Doehler Metal Furniture Co., New York

Filling In the Gaps

Holes in the mobilization base get attention in view of five year requirements

MILITARY REQUIREMENTS will be more realistic in the days ahead. Mobilization planners are getting down to the serious business for the second time since World War II of trying to identify the gaps in the mobilization base and to plug those holes in anticipation of a future full mobilization.

Under new orders the joint chiefs have been told that while both the industrial and civilian economy will be cut to the bone, essential requirements for the civilian economy will have to be taken care of. Military requirements must be feasible. As a result, the defense department has been given a percentage of total hard goods capacity and told to figure their requirements within that percentage. Five year requirements are now under study.

Sweating It Out—In fact the assignment of the percentage which is classified does not allow for any product mix that the joint chiefs might desire because of bottlenecks and spot shortages which are bound to occur. At the moment, the Defense Department is attempting to sweat out a product mix which would fit into its share of the economy. Other requirement planning now includes bare-bone needs for schools, hospitals, housing, transportation, roads, fuel and even the possibility of post attack problems in which some existing facilities would be bound to be knocked out.

The first job is to get requirements. The second is to identify shortage areas which would cause trouble in the event of full mobilization.

Ways and Means—The first try to plug the holes in the mobilization base will be to use the tax incentives provided under existing loan programs. Other incentives available under current legislation will be used if needed. Finally, if need be, there will be plans for government - furnished equipment and perhaps stockpiling of some components and semi - finished forms and shapes of material and production equipment.

New Posts for Ralph Howe

Ralph S. Howe, above, has a pair of new jobs in Washington. He becomes special assistant to the DPA administrator on machine tools and also is to advise ODM's Advisory committee on Production Equipment. Mr. Howe will remain in his present position as director of the NPA Metalworking Equipment Division until Nov. 1. Donald M. Pattison, Warner & Swasey Co. vice president, will replace him there. Mr. Howe is executive v. p. of New Britain Machine Co., New Britain, Conn.

A new drive to minimize shortages of ferroalloys and other hard-to-get metals in the event of all-out mobilization has a few added teeth. The Defense Production Administration gets the top co-ordinating job of making quarterly analysis of the demand-supply position of the ferroalloys and other affected metals. These estimates will be based on five-year full mobilization requirements, conservation practices, and supply expansion. The purpose is to permit a continuing appraisal of the size of the risk resulting from prospective shortages.

Various Approaches — The Defense Materials Procurement Agency was told to take the program goals fixed by DPA on hard-to-get materials and use any of the following measures to increase production:

1. Loans and advances.
2. Grants for exploration and technological development.
3. Long term contracts with market guarantees and prices "substantially higher than current market prices."
4. Bonus payments for accelerated delivery, including the underwriting on an arbitration basis of additional costs which might result.
5. Negotiations for additional supplies from foreign governments.

Basis of many of the decisions to expand will be stockpile objectives. The Munitions Board was ordered to give priority to a review of objectives. The review would be made jointly by the Munitions Board and the secretary of the interior. The job of estimating supply-demand position of friendly countries was left to the Mutual Security Agency.

CHECKLIST ON CONTROLS

Materials Order

ALLOY SCRAP—Amendment of Oct. 15, 1952, of Direction 1 to NPA Order M-20 permits firms to report alloy scrap inventories by their locations in individual plants rather than in an accumulated inventory for the firm. The amendment was effective Oct. 15.

Price Regulations

DEFENSE CONTRACTS—Amendment 3 of Revision 1 of General Overriding Regulation 2 removes a requirement that ceiling prices be stated in connection with defense contracts and subcontracts. All that's needed now is a simple certification that the price does not exceed the ceiling. The amendment was issued Oct. 13, 1952, and made effective Oct. 16, 1952.

FABRICATED STEEL — Amendment of Oct. 13, 1952, of CPR 156 makes several clarifying changes in the price regulation covering fabricated structural steel, miscellaneous and ornamental iron, and vessel shop products for field assembly or erection. The amendment was effective Oct. 18, 1952.

REINFORCING BARS — CPR 174 issued Oct. 13, 1952, and to become effective Nov. 1, 1952, is a tailored regulation establishing ceiling prices for independent sellers of prepared concrete reinforcing bars and reinforcement materials. Also established are ceilings for integrated mill affiliates which sell reinforcing bars in competition with independent sellers.

RADIO, TV PARTS — Amendment 7 of Revision 1 of General Overriding Regulation 5 restores price ceilings on radio, television and phonograph parts. The amendment was issued on Oct. 15, 1952, and made effective on that date.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

NPA EYES CAPACITY FOR STEEL FINISHING

. . . missing teeth ahead in production machinery?

As basic steel output rises, NPA is taking a look ahead. It wants to be sure the finishing capacity will be there to handle the flow under full mobilization

AS THE NATION'S defense production machinery moves into high gear, NPA is looking over the probable finished steel capacity to determine how it will mesh with needs.

The basic steel will be there. American Iron & Steel Institute reported 72,700,940 tons pig iron capacity on Jan. 1, 1952. This year nearly 7 million tons of capacity will be added (see STEEL, Sept. 22, p. 82) and by Jan. 1, 1955, estimated total pig iron capacity will be 85,211,150 tons if all construction of new facilities approved by DPA to date are completed. No wonder NPA is anxious to find out how the torrent of steel ingots will be converted into the requisite shapes under full mobilization.

Taking a Poll—To learn how steel-finishing capacity will balance upon completion of the iron and steel expansion program, NPA mailed steel companies copies of a special form to be returned by Nov. 15. Questions pertain to mill capacity to produce several critical products: Heavy standard rails, certain tube rounds, cold-finished bars of a particular size group, heavy structural shapes, wide flange beams, plates, and seamless pipe and tubing.

Because of the importance of the appraisal, the agency consulted members of the industry to determine how it might be conducted most effectively. The conclusion was that it should consist of two parts collection of basic statistical data on the character of the present expansion program, and the capacity that will be achieved as a result of it.

Then — Collection of this information will be followed by a series of consultations with steel industry experts on whether capacity to produce particular types of steel will be sufficient. What their conclusions will be cannot be foretold, but it's safe to guess they'll find some missing teeth ahead in our geared-up defense production machine.

Leaving Its Mark on Steel . . .

Interest in persuading steel producers and warehousers to mark alloy steel bars as to compositions is intensified in the Air Force and the Defense Production Administration by the development of two continuous marking machines and an ink that puts markings on steel through grease and oil films. The machines are built by Pannier Corp., Pittsburgh, and Superior Marking Equipment Co., Chicago, and the ink is the product of the Superior company. They take up little space and can be adjusted to mark bars, rods and tubes from $\frac{1}{4}$-inch to 6 inches in diameter. Users report good results and the Philadelphia Navy Yard is now installing them. They are being used mainly on different analyses of cold-finished aircraft steels. So far no marking system has been developed that can cope with the temperature and scale problems encountered with hot-rolled bars, rods and tubes.

Dawn in December . . .

Manufacturers who have been complaining about complexity and confusion in selling to the government will be pleased to know that the first federal catalogs to embody the results of recent simplification and standardization will appear soon.

Before the end of December a catalog of food items will be published. At intervals thereafter will appear other catalogs now in the works covering medical supplies, clothing, common hardware, antifriction bearings and some other groups of common-use items. In addition to representing a currently good job of simplification and standardization, they will reflect a substantial approach toward the ultimate goal of a single catalog for all federal procurement—both civil and military.

A Nickel Saved . . .

The Navy has authorized use of Type 303 stainless steel as a substitute for monel metal in certain lubrication fittings. It has been found satisfactory in elbow bodies, straight fittings and in tips of lubrication fittings for all uses except under water. The change will save approximately 52,000 pounds of nickel a year.

CHARGING BUGGY?

no, this is a "Charging Buggy"

This Morgan buggy places billets or slabs in the furnace singly or in multiples so that both ends are equidistant from the furnace walls. The fitting of a telescopic ram to the buggy makes possible the charging of billets and slabs of different lengths. The quick and precise operation of this charging mechanism makes possible an uninterrupted flow of billets or slabs through the heating furnace with resultant uniform temperatures throughout the entire length of the billets or slabs.

Your problem may be different. If it relates to equipment we build, why not talk it over with our engineers?

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

English Rep., International Construction Co., 56 Kingsway, London W. C. 2, England

ROLLING MILLS • MORGOIL BEARINGS • WIRE DRAWING MACHINES
REGENERATIVE FURNACE CONTROLS • EJECTORS • GAS PRODUCERS

RM-8

The day the wind blew!

How can it happen to us! Our dream house . . . coming apart at the seams . . . disintegrating to the cheap paper from which it was built. Where can we go . . . who will help us!

The sun was bright the day we bought this home. Birds were singing and the soft breeze didn't even ruffle the paper siding. The man who sold it promised it would last a lifetime. It was all so easy . . . so simple . . . and uncomplicated.

Fortunately, most Americans won't buy a house made of paper . . . but many of our countrymen are willing to live in an economy based on paper.

We know it takes more than just money churning the rounds of circulation to make a nation great. We know it requires sound investment . . . real goods . . . high production . . . and unquestioned faith in fellow man. Yet a paper economy is so easy to buy . . . so simple to acquire . . . and even uncomplicated. There are those who will guarantee it for a lifetime!

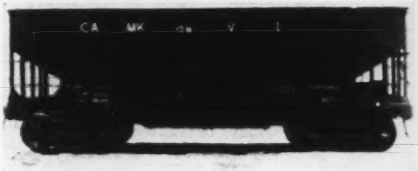
A financial house constructed of paper will just as surely disintegrate at the first winds of an economic storm as will a house of paper.

If it happens to us . . . where can we go . . . who will help us!

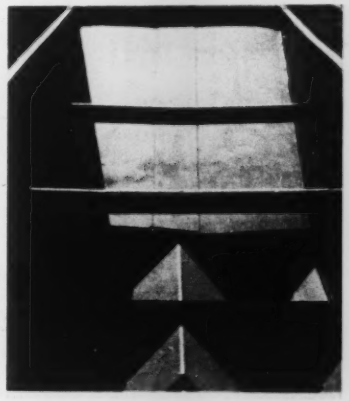
*Cold Wrought Metal Fasteners by

Chandler Products Corp.

1491 Chardon Road • Cleveland 17, Ohio



Ballast-type hopper car (left) was redesigned so that roadbed ballast can be released to sides and center of track (right).



U.S. Hopper Cars for Venezuelan Service

Chicago Freight Car & Parts Co., Chicago, is just completing shipment of 40 ballast-type hopper cars to Venezuela where they'll be used in building and maintaining a 90-mile-long railroad serving U.S. Steel's new Cerro Bolivar iron ore mine. Originally twin-hopper type cars used in coal service, the cars have been redesigned and rebuilt by CFC&P so that roadbed ballast can be released to service the roadbed free from the rails and in the exact quantities required. Each car has a load limit of 125,000 pounds.

Machine Tool Imports Hit a Peak

Foreign machine tool entries into the U. S. smashed records in first half, 1952, mainly through deliveries on orders placed in 1951. Fewer new orders are going abroad

IMPORTS of foreign machine tools into the U. S. multiplied seven times in the first half of 1952 over the first half of 1951, $25,937,845 vs $3,708,838. That exceptional growth represents actual deliveries on the plethora of orders placed abroad in 1951. Future prospects for sustained foreign machine tool imports are dim.

Firms importing foreign tools report new orders are below last year's level for this period. Only special precision machines are holding their own in the American market. Heretofore, zooming imports had been reported across the board.

Onward and Upward—For example, the Commerce Department's Foreign Trade Report #110 shows imports of gear cutting machines (Schedule A, Code #7400200) rose from $120,163 in January-June, 1951 to $184,258 in January-June, 1952; punches, shears & bar cutters (Code #7400300) jumped from $78,215 to $131,015 in that period; jig boring machines (#7400700) more than doubled from $413,425 to $1,056,487; other cutting type machines (#7400800) ran away from $1,407,317 to $18,589,217; and other machine tools and parts not elsewhere classified (#7400900) rose from $1,689,718 to $5,976,868.

During the first half of 1952 the leading supplier nations shuffled positions, with Germany and Italy gaining ground and Switzerland and the U. K. losing some. For first half, 1951, percentages of total dollar machine tool imports were: Switzerland, 30 per cent; Germany, 20 per cent; U. K., 17 per cent; Italy, 15 per cent; and all others, 18 per cent. In first half, 1952, the leaders were: Germany, 30 per cent; Switzerland, 20 per cent; Italy, 20 per cent and U.K. and all others 30 per cent.

Downward Now?—Perhaps the biggest single reason foreign tools will have a more difficult time on the U. S. market in the future is the position of the American machine tool industry. U. S. producers are hitting a $100-million-a-month production stride and are looking for ways to maintain that level in the face of diminishing defense needs (STEEL, Sept. 22, p. 92).

Duties on Machinery Suspended

French import duties have been suspended on a wide range of industrial equipment until Dec. 31, 1952. In the forefront of French industry pushing for such tariff relief since 1948 are French textile producers and the duty suspension includes a long list of textile machinery. Normal rates of duty on the products affected range from 15 to 25 per cent.

Other than textile machinery, duties are suspended on: Pumps and compressors; machine tools; equipment for drilling oil wells; and equipment for the ceramic, glass, food, rubber, plastic, chemical, paper and leather industries.

Details on the products benefiting from this suspension may be obtained from the European Division, Office of International Trade, Department of Commerce, Washington 25.

Belgian Exports Firm Slightly

Belgium's steel export market, after softening considerably in July and August, has firmed up slightly again. Better customers are the U. S. and European Payments Union countries while the German market tries to extricate itself from export license difficulties. Generally, order books are not overfilled and deliveries are short.

Approximate price quotations for E.P.U. markets are:

	per metric ton
Con. Reinforcing Bars	$120
Merchant Steel	120
Structurals	122
Plates	$155-$160
Sheets	$180-$185
Wire	117
Galvanized Wire	130

For the dollar zone, prices quoted are approximately 3 to 5 per cent lower than those given above.

PLANT PROTECTION

Industrial Firms Are Getting Safer

LOOK! A FIRE has started.

It's in the waste basket . . . no, it's spreading. Now, it's really going fast. The wooden roof of the men's lavatory will be n e x t. Then, there's the die shop next door. And barrels of oil and gas. This may be a $150,000 blaze.

Denouement—But, wait a minute. Someone's already putting the flame out. "Somebody turn off that bell. Let's see, only about $25 worth of damage. It's ok; everybody back to work."

That actually happened at the Roth Steel Products Co. plant in Cleveland during the second shift on Oct. 8, 1952. Credited with averting a possible disaster was an American District Telegraph Co. fire and bell alarm system.

Stage Props—Professional plant protection agencies divide their efforts about evenly between two services: Fire protection and burglary protection. In both cases, they have a multitude of automatic gadgets to back them up. The continuous electric circuit remains the standard method, but electric eyes, pressure tubing, radar and radio applications are common.

Roughly 50 per cent of alarm devices manufactured by such companies as the H & F Watchman Co., Detroit, go into industrial installations. H & F's specialty is a combination alarm and floodlight system which has the double effect of sudden noise and bright light—mortal enemies of the thief.

Protagonists — Automatic plant protection has grown tremendously since World War II only partially as a result of increased versatility in these automatic devices. The other big reason is increased costs of the traditional mode of plant protection, an old man with a lantern.

A watchman must be paid about $1.30 an hour and he works a 40-hour week. With three such watchmen, plus overtime and replacement costs for holidays, automatic systems can cut costs approximately in half. At that, the mechanical or electrical guard will keep a constant check on such things as water temperature and levels in outside water tanks where the customary elderly watchman may not be physically able to do so.

Setting the Scene — Automatic systems, though varied, operate something like this: A gadget in your plant signals something has gone wrong. That signal goes directly to a central office where trained personnel identify the trouble. Then, depending on the nature of the alarm, the police or fire department are notified, usually by direct telephone lines and perhaps by a teletype arrangement. The company man, or a group of such men, is sent to the scene and you, the owner, are notified.

Great care is taken that the men who answer the alarm will be conscientious and able to cope with the emergency. ADT has an elaborate set of screenings for all personnel. And that even includes the ADT salesman who enters your plant to estimate the job, adds C. L. Chafee, ADT district supervisor of sales. Wm. J. Burns International Detective Agency gets a complete work record all the way back to their school days on the men they hire. J. Walter Kelly, a district manager for Burns in Pittsburgh, comments: "We like the older men (in their 40s) who have a good family background and who are healthy."

Curtain Raiser — Defense work has had a telling effect on the growth of industrial protective systems, too. In fact, adequate guard and alarm coverage is a firm requirement for companies seeking jet engine contracts.

Electronics Production Rises

Although civilian production of radio and television receivers is booming, the industry has accomplished a tenfold increase in defense work since June, 1950, an advisory committee told the National Production Authority.

Radio manufacturers now in their busiest season are worrying about shortages of assembly-line workers and spot shortages of 21-inch picture tubes and certain types of tubes and components. Military deliveries of electronics equipment have not yet been affected, but NPA warns of possible shortages of copper and aluminum in 1953. Radio manufacturers expect a steady supply of steel after the steel industry has had time to work off its order backlog.

Liberia: More Ore in Store

American iron and steel mills will look to distant Liberia for larger supplies of iron ore in the future. You can expect ore deposits in the Bomi Hills of Liberia to yield 1.2 million tons annually for many years.

The Liberian Mining Co. Ltd., whose majority stockholder is Republic Steel Corp., Cleveland, began mining operations in the Bomi Hills, near Monrovia, in 1951. A recent share-the-profits plan with the Liberian government promises continued good will between that republic and ours. Liberia will receive 25 per cent of net profits for five years after 1957; 35 per cent for the next ten years and 50 per cent thereafter.

Liberia has grown rapidly in importance as a source of iron ore for American industry. Previously a non-supplier, the African country became the sixth largest exporter of such ore to the U. S. in the first seven months of this year.

The surface has barely been scratched in Liberia. The Bomi Hills deposit has contributed 500,000 tons of ore since shipments began in June, 1951, yet company officials estimate the mine contains between 30 and 40 million tons of high grade ore and about 100 million tons of good ore, assaying about 55 per cent iron.

MISSING TOOLS

What would you do about this problem?

"Although we have a tool checkout system, small tools somehow manage to disappear. Hammers, wrenches, screwdrivers and files are the most frequently lost. With a shop of only 200 employees, we figure our bill is over $2500 a year in small tool replacement for pilferage alone. We don't want to point the finger at anyone, for in many cases the tools were borrowed with the honest intention of returning them. But the cost is running too high to let this loss continue. How can we handle this situation without giving our employees the impression we think they're all thieves?"

● I agree that in most cases a tool is borrowed with honest intention to return it. But, if an employee, pressed by the need for the tool, feels that he must resort to dubious methods to take the tool out and again to bring it back, it is obvious what will happen.

Some time ago, when in charge of a small shop, I was confronted with the problem and adopted this policy with good results. Rather than discourage or prohibit the borrowing of tools, arrangements were made to make it easy and proper for an employee to do so. It was made known generally that management wanted to help any employee that needed a tool he could not afford to buy.

Two passes were issued upon an employee's request for a tool in his presence. One was given to him to surrender when taking the tool out; the other was held and given to him the day before he promised to return the tool. The latter served as a routine reminder to which no one could take any offense; the first was used as a check on the completion of the obligation. Thus the practice could be controlled.

C. W. VOKAC, Manager
Hydro-Arc Furnace Dept.
Whiting Corp.
Harvey, Ill.

● In some cases a man may borrow a tool with the intention of returning it, but I don't think most employees even consider stealing tools an act to be criticized, much less actual theft. They figure "the company has plenty more where that came from."

There's little appealing to a worker's sense of honesty when it has been corrupted by the "getting something for nothing" philosophy of our times. The only way to stop tool pilfering is to make a rigid check-up on tools at the end of each work period in the shop so that any missing tools may be immediately pin-pointed and the person responsible held to account.

PAUL O. MIX
Mix Mfg. Co.
Cleveland

● . . . solution arrived at was this: Rather than checking out small tools like files, hammers, screwdrivers, etc., each employee was provided with a basic set of tools marked with his clock number and a tool box which could be locked. The identifying number prevented workers from getting the wrong tool by mistake and taking tools to make up deficits in their own boxes when periodic tool checkups were held.

To the best of my knowledge, virtually no tools were lost under this plan.

H. E. MILLER
Miller Mfg. Co.
Elyria, O.

STEEL

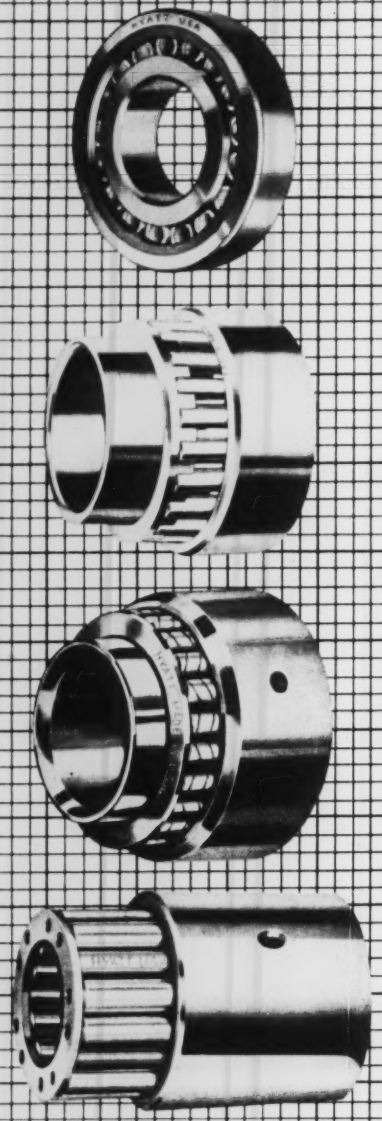
This week STEEL introduces a new feature. Its purpose will be to bring problems confronting metalworking executives today before the most competent panel to consider them — other metalworking executives. Each week STEEL's Management Clinic will carry a new problem for solution by management and print replies as they are received. We'll welcome your comments on these problems for publication.

To get our new feature started, we asked some of our friends to give us a head start by writing in advance. Maybe you don't agree with what they said or have ideas of your own on how the problem should be solved. Send your solution, or any new problem you would like to see discussed, to "Management Clinic", STEEL Magazine, Penton Bldg., Cleveland, O

CONSIDER THIS PROBLEM—"We have two foremen who are both good workers and have a lot of shop-savvy, but their ability has led to competition that has turned into feuding. They're both in our grinding department and their failure to co-operate has cut output by about 20 per cent over the past few months. One will tear down a job setup when he's through with it even though he knows the other will be using all or part of it. Arbors and wheels are frequently misplaced just before they're needed.

"They're both good men individually. Is there any way we can get them pulling together again?"

Other metalworking executives will be interested in learning how you solved the "foremen feuding" problem in your plant. Solutions of this problem will be published starting next week with more solutions to the missing tool problem.



Maximum Radial Bearing Capacity... with HYATTS

If radial loads are involved you don't sacrifice radial capacity to satisfy other requirements. Use Hyatt straight cylindrical roller bearings which provide maximum load-carrying capacity within given boundary dimensions.

When you design with Hyatts you avail yourself of many optional approaches, permit greater flexibility in your layouts, and save precious time by taking advantage of Hyatt's sixty-year bearing application engineering experience.

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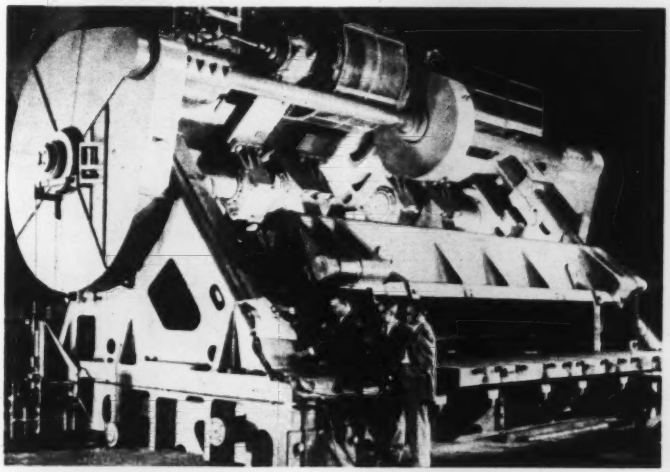
HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



Powerful Press Bends Steel Sheets

A massive press at A. O. Smith Corp., Milwaukee, bends steel sheets edgewise in manufacture of auto and truck frames. This powerful press works sheets as long as 19 feet. Falk Corp., Milwaukee, machined the casting. Looking at blueprints are, left to right: T. E. Dillon, truck frame manager, automotive group; Bertil Winstrom, manager of machinery and equipment; and A. L. Leiser of his staff

Automakers are uneasy again about steel. They have been cashing in CMP tickets right and left and now may have few left for the first quarter

DETROIT

THERE'S AN air of uneasiness in the motor industry which has developed in the last week or so. It stems from doubts as to how much steel will be provided next quarter.

The problem of many members of the industry boils down to this: They will have used up their third and fourth quarter CMP steel tickets in their production drive this year. There will be no carryover into first quarter. Some, in fact, may even try to borrow against first quarter allocations to keep production roaring through December.

Changed Tune — Whereas most members of the industry met the announcement by DPA that first quarter steel allocations would be only about 60 per cent of third quarter with something akin to equanimity — an exception was Chrysler—many now are wondering whether the steel quota cut will be permitted to stand. If steel tickets are issued for only 630,000 passenger cars—the allocation now set up for NPA's Motor Vehicle Division—there simply will not be enough conversion or foreign steel available to enable the industry to produce the 1,250,000 cars it has been authorized to make. NPA had explained, in issuing the lower steel quota, that carryovers would make the difference, and there seems to be little doubt that more steel will be available to all industry in first quarter than ever before in history.

The automakers are growing fearful that Washington people will not face up to what industry believes will be realities in time to head off severe production curtailments. Lead time is the factor which many automen think the planners do not understand. Chrysler's president, L. L. Colbert, has presented his views to NPA, by calling the first quarter steel allocation the "most unreal program to date," and informing NPA that a 90-day lead time is required for steel ordering. He warns that Chrysler's production will have to be cut substantially immediately after Christmas if an increase in allotments is not forthcoming.

Behind the Times? — What bothers the auto industry most is its conviction that the government's lagging statistics will keep the planners from knowing when steel becomes plentiful. The industry has seen it happen too often not to have good cause for worry on this score. Chrome stainless, aluminum and copper have all gone through that cycle.

There is a touchy aspect to the automakers' first quarter steel problem. If the industry gets all the material in fourth quarter for which it has tickets and has no carryover it may be because it enjoys a favored position with steel mills. If there are other industries which are not able to cash all their fourth and third quarter tickets before next year, these are likely to raise a furor if the automakers are considered for any increase in first quarter allocation. The auto industry might wind up fighting not only NPA but every other steel consuming industry as well. The steel industry, in this case, would be squarely in the middle.

Complication — The situation is made the messier because not all steel products will ease at the same time or in the same degree. Flat-rolled products are in nowhere near as tight supply as bars, and some observers believe the bar shortage is worsening. One explanation is that the military's stock of World War II shells has now been exhausted and production must be stepped up to keep pace with the bigger war in Korea.

Though not all automaking companies may be able to clean up their tickets this year, and there-

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fore may not be as vitally concerned with first quarter allocations as Chrysler, for example, there is now a decidedly pessimistic view of the production outlook. About the most descriptive comment that could be heard last week was that made by Richard E. Krafve, assistant general manager of Lincoln-Mercury division. He said "We are taking a calculated risk this quarter." The industry's hope is that the steel picture will be clear enough soon for the risk to pay off.

Surprises on 1953 Models

Surprises are in store for people who are interested in 1953 models, but few will be any bigger than the news that 1953 Lincoln will be equipped with an engine which develops 205 horsepower. This puts it close to Cadillac's 210 hp.

To get this kind of output from a new engine which in the current model is rated at 160 horsepower, the Lincoln engineers have taken a path which is fundamental - they increased the engine's "breathing." This means that a new intake manifold and a four-barreled carburetor have been added and that valve diameter has been substantially increased. A new design in spark advance control linkage has been incorporated. Net result is an engine which has propelled a strictly stock car under AAA supervision in timed tests on the straight-away at over 117 miles per hour, and on a 10-mile circular course for 100 miles at 114.81 miles per hour.

Another surprise is the rumor that the new Buick overhead valve V-8 engine, originally destined for installation only in the Roadmaster, is in large enough production to be obtainable also in the Super series when the '53s are introduced.

Other surprises, of a different kind, are the reports to the effect that neither Ford nor Mercury will be equipped with the new overhead valve V-8 engines which were scheduled for this year. Chevrolet is another company whose new V-8 engine will not grace the '53s, but horsepower in its Six is reportedly being upped 13 points to 105 in the standard model and 10 points to 115 in the Powerglide-equipped cars.

Auto, Truck Output

U. S. and Canada

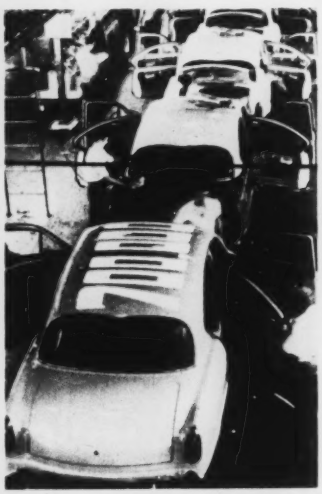
	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	593,060*	505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	1952	1951
Sept. 13	137,295	136,150
Sept. 20	147,748	135,015
Sept. 27	142,893	113,973
Oct. 4	143,234	112,868
Oct. 11	139,160	120,543
Oct. 18	140,000*	120,810

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Possibly the most unusual of the surprises is that which emanates from Willow Run. Kaiser-Frazer Corp. in bringing out its 1953 models has taken a thin slice from the price of all Kaisers and of the lowest listed Henry J. The cuts range from $4.04 to $24.56 in the advertised delivered prices of Kaisers, while the economy-model Henry J is scaled down by $18.49 to bring its advertised delivered price to $1 less than $1500. Feeling throughout the auto industry has been that 1953s would reflect higher steel costs. It appears now that competition may be an offsetting if not overriding factor.

The new Kaisers have their horsepower stepped up 5 points to 120 through use of a new manifold, muffler and exhaust system which reduces air-intake friction and minimizes exhaust back-pressure.

Safety features are again emphasized, additional padding having been added to the instrument panel crash pad. A similar panel has been added to the Henry J's dash, as one of the 40 engineering and styling modifications of that car. Length of the Henry J has been increased three to six inches to 181 inches for the Corsair and 184 inches for the Corsair deluxe. This has been accomplished by adding a new rear bumper and splash shield. Though no change has been made in horsepower, the car's performance is said to be enhanced through a greater oil capacity, reduction in bearing loads by a piston design change and addition of a new heavy-duty clutch assembly.



Kaiser's 700,000th Car

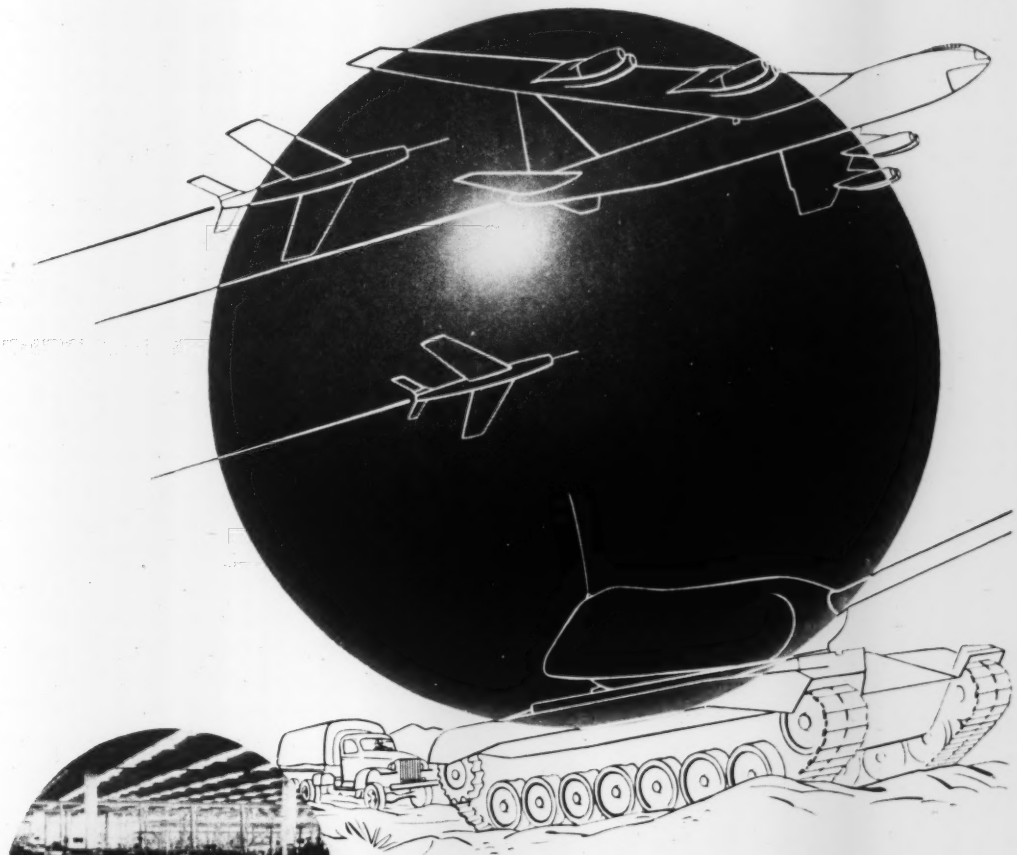
A four-door Kaiser sedan, 700,000th car produced by Kaiser-Frazer Corp., Willow Run, Mich., moves triumphantly down a busy assembly line. Kaiser-Frazer's production has been achieved in six years since the first car was produced in 1946. Among changes noted in the 1953 models are the garnish molding at the belt line and under the rear window, and the lack of external hinges on the trunk of th's Kaiser

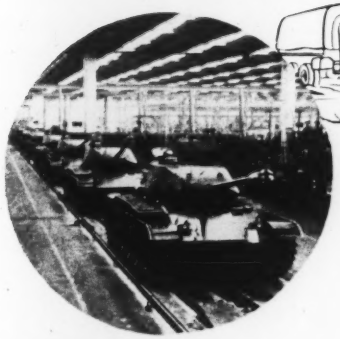
Chrysler Studies Packaging

Investigation into packaging may sound like it is far removed from the work of a metallurgy laboratory, but not according to Chrysler Corp. In planning the equipment for and the work to be done at a new facility in San Leandro, Calif. the lab will be set up to maintain and improve the production quality of Hamilton Standard Aircraft propellers which Dodge Division will make in the auto assembly plant there.

"An important part of the laboratory program," according to Dodge President William C. Newberg, "will cover the packaging of the finished product so that propellors shipped to the Arctic or to humid tropical climates will be safeguarded." Salt spray, cold and humidity cabinets will be installed.

SILENT SOLDIER FOR DEFENSE!





Factory, Farm and Fighting Front...

• On the Korean front . . . on farms deep in the heart of America . . . in factories geared to the needs of defense . . . New Departure Ball Bearings are worthy warriors.

• In a great variety of applications New Departures increase accuracy, permit higher speeds and resist *all* loads. They also reduce maintenance and help simplify design problems. New Departure engineers are available for everything from new design jobs to improvement of existing installations.

• The Great Ball of New Departure is the symbol of *engineering excellence* . . . leadership in research. Keep your eye on the BALL to be sure of your BEARINGS!

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MOST STABLE GAGE STEEL EVER MADE!

...and outwears others 3 to 1!

NEVER before has a tool steel offered gage users and gage makers so many advantages! Graph-Mo* tool steel is a *different kind* of tool steel. And the difference is so real you can see it—in the form of tiny, scattered, parallel marks barely visible on the surface of a piece of polished Graph-Mo.

These marks are the result of free graphite in the steel's structure. And this free graphite, together with diamond hard carbides, enables Graph-Mo to outwear other tool steel an average of 3 to 1. Reports from dozens of gage users prove it! (Details on request.)

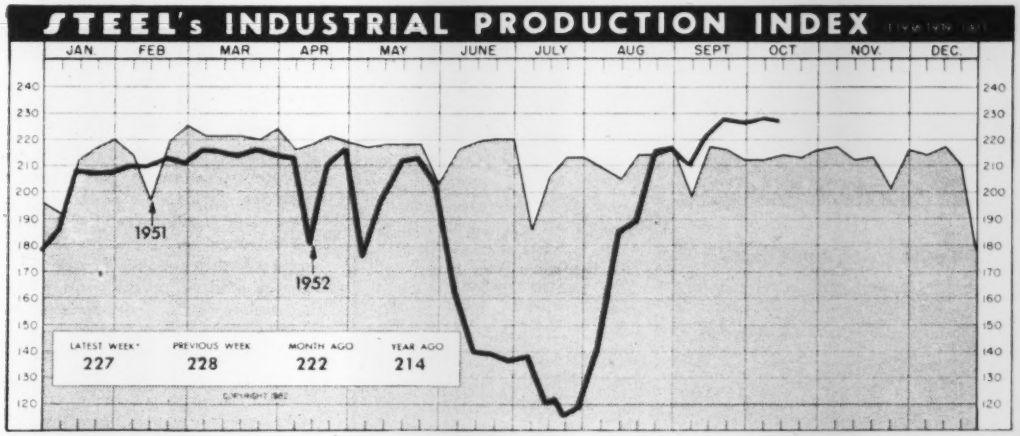
Tests prove Graph-Mo is also the most stable gage steel ever made. After a 12-year period a typical Graph-Mo steel master plug gage showed less than 10 millionths of an inch change from its original measurement.

And constant pressure machinability tests show Graph-Mo machines 30% faster than other tool steels. (Machinability test data on request.)

You can always tell Graph-Mo by its "graphitic look". This built-in "trade-mark", the result of the free graphite in its structure, can't be duplicated in other steels. Look for it, insist upon it, next time you buy gages. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Oct. 11

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Ward's Reports) 20%

Production may start to level off in the next few months as new orders drop below production rates. Index edges down as passenger car changeovers occur

WILL MOST metalworking companies continue to step up production in the months ahead? Or is a general leveling-off period around the corner? Prime indicators point to either possibility.

At present most metalworking companies are striving to boost production. Defense work is going strong for many fabricators. And civilian output is increasing considerably in a number of industries. This production boost is particularly dramatic in the automotive and household durables industries. Unfavorable indicators, however, are clouding the production scene.

The Other Side—Output in several key industries—among them, foundries and forging—is already leveling off. In many cases, production is dropping considerably. Prime reason for this is many companies didn't get the expected jump-up in orders when steel production resumed after the strike. Some of their customers are remaining cautious about increasing inventories, while materials controls are restraining other customers from purchasing.

Another brake on production is the defense stretchout. Companies set up for defense work found their delivery dates moved back. Some foundries are now down to three and four-day work weeks, despite towering order backlogs. They hope that the government will start moving up delivery dates in the fourth quarter.

Reflections—Reflecting a dip in automotive operations, STEEL's industrial activity index during the week ended Oct. 11 inched down 1 point to 227 per cent of the 1936-1939 average. Steel production moved up 1 percentage point to 104.5 per cent of rated capacity. Freight car loadings and electric power generation remained strong in the week ended Oct. 11.

Fast Pace for Autos . . .

Keen competition in passenger car sales may start in the final months of 1952. Automakers are maintaining their high car output to fill dealers' stocks depleted by the steel strike. If this production level is held, we may see one of the liveliest merchandising efforts in many years.

Right now, U. S. plants are keeping passenger car output considerably above the year-ago passenger car assemblies, despite the healthy bite changeovers are taking in the total output. In the week ended Oct. 11, the industry rolled out some 101,267 passenger cars, compared with 91,130 units in the like week of 1951, says *Ward's Automotive Reports*. Changeovers and labor difficulties at Chrysler Corp. were responsible for the 2000-unit decline from the previous week.

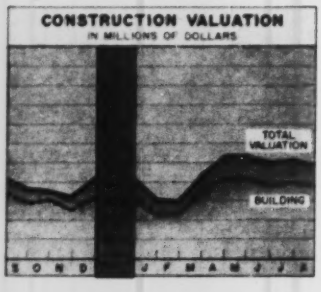
Truck operations are moving at a steady pace. Truck assemblies by U. S. manufacturers in the week ended Oct. 11 totaled 29,186 units. This compares with 29,936 trucks in the previous week and 23,349 units in the week ended Oct. 13, 1951.

Almost all the truck producers are maintaining output well above the year-ago levels, although supplier strikes are trimming production among some companies.

Combined U. S. and Canadian auto-truck operations in the week ended Oct. 11 dipped 4074 units to 139,160 passenger cars and trucks. In the same week in 1951, U. S. and Canadian plants rolled out 120,543 passenger cars and trucks.

High-Level Steel Production . . .

Steel plants are keeping production near record-high levels as



Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1952	1951	1952	1951
Jan	902.2	1,043.2	695.4	881.9
Feb	885.2	1,140.5	697.8	962.3
Mar	1,321.2	1,267.4	1,056.0	1,043.8
Apr	1,597.5	1,375.0	1,243.9	1,108.9
May	1,563.6	2,573.0	1,216.2	2,295.0
June	1,488.8	1,408.9	1,133.3	1,098.4
July	1,511.3	1,379.8	1,170.8	1,084.7
Aug	1,438.7	1,262.8	1,147.5	1,043.5
Sept		1,052.9		884.2
Oct		1,051.4		914.4
Nov		931.8		771.6
Dec		1,234.3		959.1
Total		15,751.6		13,027.9

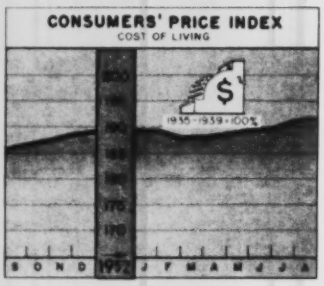
F. W. Dodge Corp.

Wholesale Price Index

(1947-1949 = 100)

	1952	1951	1950
Jan	113.0	115.0	97.7
Feb	112.6	116.5	98.3
Mar	112.3	116.5	98.5
Apr	111.8	116.3	98.5
May	111.6	115.9	99.6
June	111.3	115.1	100.2
July	111.8	114.2	103.0
Aug	112.1	113.7	105.2
Sept		113.4	107.1
Oct		113.7	107.7
Nov		113.6	109.3
Dec		113.5	112.1

U. S. Bureau of Labor Statistics

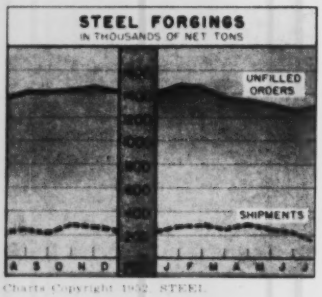


Consumer Price Index

(1935-1939 = 100)

	1952	1951	1950
Jan	189.1	181.5	168.2
Feb	187.9	183.8	167.9
Mar	188.0	184.5	168.4
Apr	188.8	184.6	168.5
May	189.0	185.2	169.3
June	189.6	185.2	170.2
July	190.8	185.5	172.0
Aug	191.1	185.5	173.4
Sept		186.6	174.6
Oct		187.4	175.6
Nov		188.6	176.4
Dec		189.1	178.8

U. S. Bureau of Labor Statistics



Steel Forgings

Thousands of Net Tons

	Shipments		Backlogs	
	1952	1951	1952	1951
Jan	271*	138	1,472*	709
Feb	277*	129	1,464*	781
Mar	266*	161	1,360*	875
Apr	277*	154	1,349*	924
May	263*	266*	1,319*	1,208*
June	221*	240*	1,248*	1,264*
July	132*	220*	1,200*	1,361*
Aug		240*		1,436*
Sept		225*		1,419*
Oct		280*		1,427*
Nov		256*		1,446*
Dec		232*		1,411*

U. S. Bureau of the Census. * Data for these months based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more. Previous data based on reports from commercial forge shops producing 3600 tons or more per year.

Charts Copyright 1952, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods	Sept. 22	Gray Iron Castings	Sept. 22	Ranges, Gas	Oct. 13
Employ., Metalwkg.	Sept. 8	Indus. Production	Sept. 15	Refrigerators	Sept. 29
Employ., Steel	Apr. 28	Ironers	Oct. 6	Steel Castings	Sept. 22
Fab. Struc. Steel	Sept. 1	Machine Tools	Oct. 6	Steel Shipments	July 23
Foundry Equip.	Sept. 1	Malleable Castings	Sept. 22	Vacuum Cleaners	Oct. 6
Freight Cars	Sept. 29	Pumps	Oct. 13	Wages, Metalwkg.	Sept. 8
Furnaces	Sept. 29	Radio, TV	Oct. 6	Washers	Oct. 13
Gear Sales	Sept. 15	Ranges, Elec.	Sept. 29	Water Heaters	Oct. 13

more new facilities come into use. In the week ended Oct. 18, U. S. producers turned out 2,197,000 net tons of steel for ingots and castings, says the American Iron and Steel Institute. That's off 18,000 tons from the previous week's record-smashing 2,215,000 net tons.

Order Backlogs Decline . . .

Business continued to improve in September, although lower order backlogs threatened to slow the upward production trend. So says the Purchasing Agents of Chicago in its monthly member survey. Production was about the same as in September, 1950, but reports of a larger order backlog were only half as numerous as the backlog increases reported two years ago. Total inventory continued to decline over the month, but a greater number of the association's members reported increases. Prices moved upward in September for over half of the members, and deliveries continued to speed up. Most buyers are confident of their ability to obtain materials on short notice. The association reports that 17 per cent of its members said they bought less than 30 days ahead, 51 per cent bought 30-60 days in advance, 25 per cent said 60-90 days ahead and only 7 per cent bought more than 90 days ahead.

Coal Output Shrinks . . .

Lack of demand and labor difficulties are trimming the nation's bituminous coal output. Bituminous coal production dipped to a daily average of only 1,495,000 net tons in the week ended Oct. 4, says the National Coal Association. This is a drop of 325,000 tons from the corresponding week of last year.

Industrial Building Rises . . .

A strong surge in industrial building is maintaining the high dollar volume of construction awards. Contract awards for industrial building in the week ended Oct. 9 totaled $106 million, about 101 per cent above the average 1952 week, says *Engineering News Record*. Major projects include a $30 million power plant addition in Weymouth, Mass.; a $20 million

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	104.5	103.5	101.5
Electric Power Distributed (million kwhr)	7,680[1]	7,665	7,160
Bituminous Coal Output (daily av.—1000 tons)	1,495	1,671	1,820
Petroleum Production (daily av.—1000 bbl)	6,520	6,514	6,338
Construction Volume (ENR—millions)	$341.6	$234.3	$220.7
Automobile, Truck Output (Ward's—units)	139,160	143,234	120,543
TRADE			
Freight Car Loadings (unit—1000 cars)	860	852	869
Business Failures (Dun & Bradstreet, number)	120[1]	129	126
Currency in Circulation (millions)[3]	$29,545	$29,417	$28,448
Dept. Store Sales (changes from year ago)[3]	+5%	−2%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,316	$17,279	$14,856
Federal Gross Debt (billions)	$264.8	$262.4	$257.0
Bond Volume, NYSE (millions)	$15.4	$16.0	$18.0
Stocks Sales, NYSE (thousands of shares)	5,438	5,178	7,445
Loans and Investments (billions)[4]	$75.8	$75.5	$71.2
United States Gov't. Obligations Held (billions)[4]	$31.6	$31.7	$30.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.40	181.40	171.92
STEEL's Nonferrous Metal Price Index[6]	219.0	221.0	234.9
All Commodities[7]	111.0	111.0	113.7
All Commodities Other Than Farm and Foods[7]	112.6	112.6	114.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

addition to Bethlehem Steel Co.'s plant at Sparrows Point, Md.

Total contract awards for all heavy construction reached $341.6 million for the week ended Oct. 9. This was 9 per cent above the average week to date. Total awards for new construction in 1952 reached $12.8 billion by Oct. 9, compared with $11.4 billion in the same period, 1951.

Slowdown for Freight Cars . . .

Deliveries of freight cars in September plunged to the lowest level since July, 1950, reports the Association of American Railroads. Showing effects of the shortage of carbuilding materials resulting from the steel strike, only 3762 freight cars were delivered in September. New orders placed last month were 134 units under September production. Industry backlog declined to 95,377 freight cars, compared with 140,135 on order Oct. 1, 1951.

A Boost from Defense . . .

Because of defense demands for aluminum and magnesium products, shipments of them continue to rise. Shipments of aluminum wrought products in August totaled 160 million pounds, representing a 7 per cent increase over the previous month and 5 per cent over August, 1951, reports the Commerce Department. Cumulative shipments this year by Sept. 1 reached 2 per cent over the same months in 1951.

Shipments of magnesium wrought products in August totaled 1.4 million pounds, about 3 per cent over July and 5 per cent over August, 1951. Cumulative shipments to Sept. 1 this year were 3 per cent over those of the corresponding period of last year.

Trends Fore and Aft . . .

Total business inventories on Sept. 1 were slightly over stocks on Aug. 1. Manufacturers' stocks rose, while wholesalers' and retail inventories slumped . . . Personal income in August reached a $267 billion annual rate, or $3 billion above July and $10 billion over the annual rate in August, 1951 . . . Marketed production of natural gas increased 19 per cent in 1951 . . . Delinquent accounts are on the increase, says the National Association of Credit Men . . . Department store sales rose 5 per cent above a year ago in the week ended Oct. 4 . . . Bank clearings rose 16 per cent over the like 1951 week in the week ended Oct. 8.

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- COLD FINISHED BARS—Rounds Hexagons, Flats and Squares
- ALLOY COLD FINISHED BARS
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- ABRASION RESISTING PLATE
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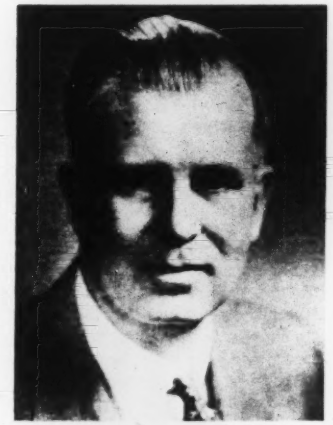


G. FINDLEY GRIFFITHS
. . . Acme Steel V. P.-sales

GEORGE H. ROUSE
. . . V. P. of Stevens Mfg. Co.

E. W. ERVASTI
. . . Wolverine Tube indus. sales

Acme Steel Co., Chicago, appointed **G. Findley Griffiths** as vice president of sales. He joined the company in 1950 and previously was vice president and general sales manager, Sharon Steel Corp. While at Acme Steel he has served as assistant to the executive vice president and assistant to the president in charge of distribution.

Donald E. McGuire succeeds **Julius A. Clauss**, retired, as vice president in charge of engineering, **Great Lakes Steel Corp.**, Ecorse, Mich. Mr. McGuire has been chief engineer since 1946.

Granite City Steel Co., Granite City, Ill., appointed **Lyle F. Gulley** assistant to the vice president in charge of operations. He is succeeded as purchasing agent of the steel mill by **Robert B. Leggat**, chief expediter. **John D. Rosebrough** was made sales manager of Granco Steel Products Co., subsidiary.

Bruce M. Regan was made manufacturing manager of plants for **Snyder Tool & Engineering Co.** and its subsidiary, **Arthur Colton Co.**, Detroit. **Robert J. Maxvill** succeeds **George Derwich** as assistant plant superintendent. Mr. Derwich was promoted to superintendent of Plants No. 1 and No. 2.

George H. Rouse was appointed vice president, **Stevens Mfg. Co. Inc.**, Mansfield, O. Before joining the company two years ago he was a manufacturers' representative on the West Coast handling Stevens thermostats.

P. R. Mallory & Co. Inc., Indianapolis, appointed **Victor Welge** associate director of engineering.

William J. Weir was appointed sales manager of wholesale accounts for **Chase Brass & Copper Co. Inc.**, Waterbury, Conn.

WILLIAM J. WEIR
sales position at Chase Brass

E. W. Ervasti, for several years sales representative for **Wolverine Tube Division**, Calumet & Hecla Consolidated Copper Co., in the St. Louis area, was made manager of industrial sales. He will have headquarters at the general sales office in Detroit.

Robert N. Harwood was named a vice president, **Solar Steel Corp.**, New York. He formerly was general manager, bar and tube division. **C. Allen Hurt** becomes package sales department manager. He was sales manager of Solar's Cleveland division. **Harry D. Curtis**, previously Detroit division sales manager, was named manager of special steel sales. At Cleveland **Harry D. McQuown** was made operating plant manager and **John D. Holdstein**, market research analyst.

Appointed to positions in the central alloy district of **Republic Steel Corp.** are **Joseph P. Charlton** as superintendent of the blooming mills at the Canton, O., steel plant to succeed **Lowell M. Immel**, named superintendent, Canton steel division; **Peter T. Reynolds** as assistant superintendent, blooming, billet and bar mills at Massillon, O., steel plant to succeed Mr. Charlton; **E. Ernest Weatherbee** as

W. F. McCABE
Union Spring & Mfg. president

D. J. JONES
Honan-Crane gen. sales mgr.

A. L. THURMAN
div. mgr. at Aetna-Standard

roll designer at Massillon to succeed Mr. Reynolds; **J. Fred Mertes** as district manager's clerk to succeed the late **R. M. Frank.**

W. F. McCabe, executive vice president, **Union Spring & Mfg Co.,** New Kensington, Pa., was elected president succeeding **H. C. Bughman Jr.,** elevated to chairman of the board. Mr. McCabe joined the company 45 years ago.

Frank J. Simpson was made vice president in charge of sales of **Thor Corp.,** Chicago. **Thomas R. Chadwick** was appointed general sales manager and **Dan R. Nighswander** was appointed product manager.

Neill S. Graham was named vice president of **Grobet File Co. of America.** He continues head of the Chicago division, Grobet File Co. of Chicago, which he organized.

D. J. Jones was made general sales manager, **Honan-Crane Corp.,** Lebanon, Ind., subsidiary of Houdaille-Hershey Corp. He has been eastern district manager.

Frank M. Wilson resigned as president, **Van Kleeck-Wilson Inc.,** Buffalo, and sold his interest in the firm to H. R. Van Kleeck who has been secretary-treasurer. The name of the company was changed to Van Kleeck Inc. Mr. Wilson will devote his time to operation of Frank M. Wilson Production Tools, Buffalo, manufacturers' representative.

Aetna-Standard Engineering Co., Pittsburgh, appointed **A. L. Thurman** manager of its plastics and rubber machinery division. He has been assistant to the vice president with offices in Ellwood City, Pa. He will direct activities of his new position from the Warren, O., plant.

J. D. Greensward was named vice president, director of manufacturing, general machinery division, **Allis-Chalmers Mfg. Co.,** Milwaukee. He recently became director of manufacturing for the division at which time he succeeded **Fred Mackey** who resigned as vice president in charge of manufacturing. Previously Mr. Greensward was general manager of the Allis-Chalmers Norwood, O., Works. **P. F. Bauer** becomes general manager there and also manager of the firm's apparatus department to succeed Mr. Greensward. **W. C. Sealey** was named chief engineer of the transformer section, power department, and **William L. Ringland** was named chief engineer, motor and generator section, power department.

Maury E. Lippert was appointed general sales manager, **Sipi Metals Corp.,** Chicago.

Walter J. Auburn, for the last 13 years editor for the *Chicago Purchasor,* monthly publication of **Purchasing Agents Association of Chicago,** was appointed advertising manager to serve in both editorial and advertising capacities. Mr. Auburn, director of purchases and advertising manager for Gerrard Steel Strapping Division, U. S. Steel Co., resigned from that organization, effective Sept. 30. **Robert A. Doyle,** purchasing agent for Glidden Co., Soya Products Division, was appointed assistant editor to aid Mr. Auburn.

John J. Grady resigned as president of Exothermic Alloys Sales & Service Inc., Chicago, to become executive vice president and general manager, **Chromium Mining & Smelting Corp.,** Chicago, and **Montana Ferroalloys Inc.,** Memphis, Tenn.

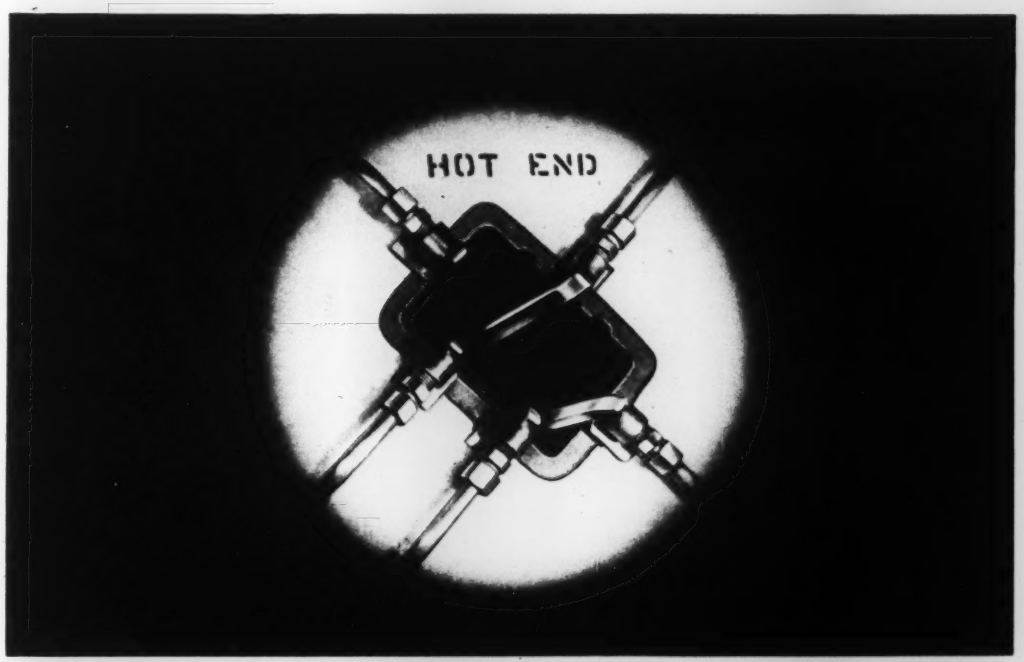
Donald L. Heir was elected president and director of **American Electronics Mfg. Co.,** Los Angeles.

John R. Markey was named assistant to the vice president, **Aro Equipment Corp.,** Bryan, O. He has been aircraft sales manager.

George B. Bond was appointed to the newly created position of sales promotion manager of the Alemite lubrication equipment and Stewart-Warner Instrument Division of **Stewart-Warner Corp.,** Chicago.

New works manager of the Hammond, Ind., plant of **Standard Railway Equipment Mfg. Co.** is **Charles G. Gruendling.**

Robert E. Cline, formerly with the Cleveland district sales office of Republic Steel Corp., joined the



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One of these parts is shown above. It is a guide rail for a TOCCO† induction hardening furnace, manufactured by The Ohio Crankshaft Co., a Superior customer.

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If you use small tubing and have a problem it might be well to check with us. We can probably help and will be glad to do so. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

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KEMPTON DUNN
. . . 1st V. P., American Brake Shoe

LYNDON B. BURNHAM
. . . Worcester Pressed Steel sales mgr.

THOMAS L. BRAY
. . . Porter's Buffalo Div. works mgr.

sales staff of **Builders Structural Steel Corp.**, Cleveland. **James S. Thomson** was promoted to manager, costs and billing department.

American Brake Shoe Co., New York, elected **Kempton Dunn** as first vice president, **William B. Jordan** as treasurer, **Robert Watts** and **Owen B. Cottle** as assistant treasurers. Mr. Dunn was formerly vice president and treasurer and has been with Brake Shoe since 1932.

Norry W. Hastings was appointed chief chemist for **Rezolin Inc.**, Los Angeles.

C. Fred Wheeler, former assistant in the advertising department, was appointed advertising and sales promotion manager of **Porter-Cable Machine Co.**, Syracuse, N. Y.

Lyndon B. Burnham will assume the duties of general sales manager, **Worcester Pressed Steel Co.**, Worcester, Mass., on Nov. 1. He held the position of vice president, Roland Teiner Co., metal spinner, Everett, Mass. Mr. Burnham replaces **Owen H. Wenning**, resigned. **George E. Gates**, assistant sales manager, has also resigned.

John H. Sibbison Jr. resigned as chief metallurgist, Superior Foundry Inc., Cleveland, and joined **American Fire Clay & Products Co.**, Canfield, O., as sales engineer.

James G. Geddes was elected president for the coming year of **Service Tools Institute** to succeed **Morris B. Pendleton**, president, Plomb Tool Co. Mr. Geddes is president of H. K. Porter Inc. of Somerville, Mass.

Thomas L. Bray was appointed works manager, Buffalo Steel Division, **H. K. Porter Co. Inc.**, Tonawanda, N. Y. He goes to Buffalo from Connors Steel Co., another Porter division, where he was assistant to the general manager.

J. Miller Brown, since 1946 sales engineer in the southwest states for **Pioneer Engineering Works**, Minneapolis, was appointed export manager.

E. D. Tull was named to the newly created position of vice president and general manager, **Cummins Engine Co. Inc.**, Columbus, Ind.

M. A. James was appointed purchasing agent of **Preco Inc.**, Los Angeles. Formerly in charge of the tool department, he succeeds **E. R. Davis**.

OBITUARIES . . .

George G. Knecht, sales manager of **Hanson - VanWinkle - Munning Co.**, Matawan, N. J., died Oct. 8.

Edward B. Sherwin, 63, president since 1935 of **Chicago Hardware Foundry Co.**, Chicago, died Oct. 10 following a heart attack.

Frederick G. Rodgers Sr., 64, an engineer for **Cyclone Fence Division**, American Steel & Wire Co., died Oct. 10 in Linden, N. J.

C. E. O'Connor, 76, retired sales manager of the Syracuse, N. Y., office of **Crucible Steel Co. of America**, died Oct. 6.

Frank S. Jones, 72, president, **Jones Machine Tool Works Inc.**, King of Prussia, Pa., died Oct. 9.

Thomas G. Johnston, 65, metallurgical engineer for **Republic Steel Corp.**, Cleveland, died Oct. 10.

Louis C. Upton, 65, chairman of the board of **Whirlpool Corp.**, St. Joseph, Mich., died Oct. 9.

Albert A. Feinberg, 59, president, **United States Air Conditioning Corp.**, Minneapolis, died Oct. 7.

Frederick B. Strale, 60, executive vice president, **Detroit Stoker Co.**, Detroit, died Oct. 2.

John S. Coldwell, 64, chief mechanical engineer for the last 25 years at **Globe-Union Inc.**, Milwaukee, died Oct. 9.

Robert X. Stiefvater, 63, of Manitowoc, Wis., purchasing agent of **Aluminum Goods Mfg. Co.**, died Oct. 9.

Edward A. Mansfield, 60, Buffalo sales representative for **Erie Forge & Steel Corp.**, Erie, Pa., died Oct. 4.

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NEWS PRODUCT
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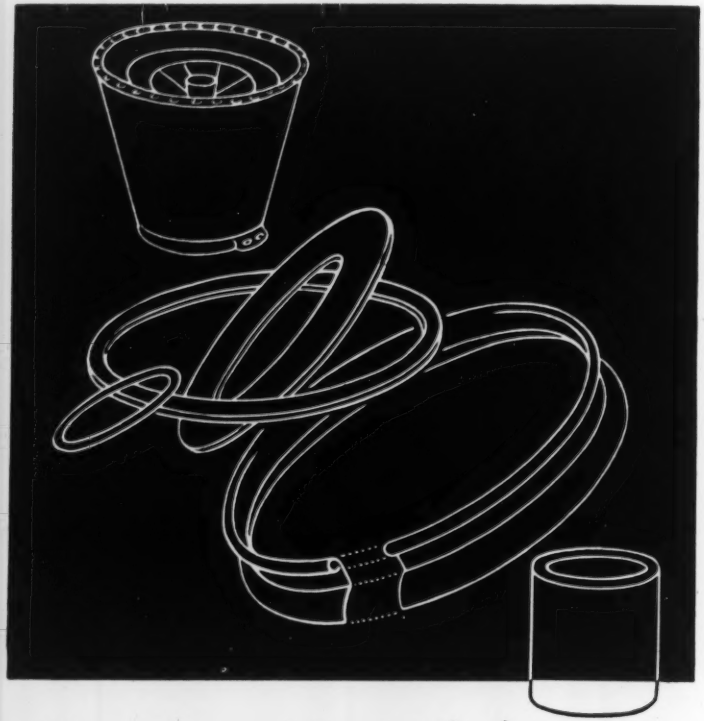
GO "AMERICAN" FOR CIRCULAR WELDED PRODUCTS



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Production AND Engineering NEWS AT A GLANCE

PLENTY OF "WONDER" GAS—Helium usually associated with lighter-than-air craft, during World War II became an important industrial tool. It made it possible to develop many techniques in welding magnesium alloys, as well as aluminum, copper, stainless steel, titanium and other metals. The Bureau of Mines believe its further growth as an industrial tool depends largely upon the rate at which knowledge concerning its properties, cost and availability can be disseminated. The current rate of production is about 150 million cubic feet per year. About 30 per cent of the helium is sold commercially, and 70 per cent is used by government departments with the Navy using half the total. Present capacity and known reserve potential are enough to meet all foreseeable demands for several decades, the bureau believes.

CINDER POTS "LIVE" LONGER—Today's cinder pots last longer in spite of the terrific beating they take daily carrying molten slag from steel furnaces at temperatures around 2900° F. They also do it despite the omission of heat resistant linings that are extremely difficult to keep in place when the pots are tipped for emptying. Reasons they stand the gaff are a design that evolved from years of on-the-job experience, and improved manufacturing techniques. Today, creation of a cinder pot requires a series of specialized foundry operations. p. 90

PHOTOGRAPHY AIDS SPOT WELDERS — High-speed spot welding is down to a science at Rohr Aircraft. A camera is used to eliminate lost time between welding jobs or changes from one contract part to another. Parts are first photographed. Then data on metal thickness and type are placed on the picture. With such a handy reference, welding operators are able to double check various metal combinations quickly and efficiently so that they may apply the proper weld strength and quality to each production run.

FAST-ACTING TOOL—Cutting rate of friction sawing is so rapid that in some cases where it is being used, it has brought about a complete revision of concepts as to what constitutes maximum production. Its principle of operation is the same as a hot knife slicing through butter. Heat needed is supplied by the saw teeth which multiply the efforts of the feeding force into the high unit pressures necessary for quick heat. This feature plus fast chip removal combine to keep the cut moving at such a rapid rate that heat penetration is no factor so far as the material is concerned. p. 92

WELDING, PICKUP MINIMIZED—New drawing compound, already in use in several installations, is increasing production up to eight times per die dressing by cutting down on welding and pickup on the dies. Developed by Metalloid Corp., Huntington, Ind., it performs well on both simple and reverse dies. Its function in drawing operations is based on the Dynatomics theory of limiting heat generated rather than transferring it. Since the compound has no pigment, it does not gum presses or ways. It also does not contribute to corrosion, and can be cleaned off by any conventional method. It's applicable to all metals from 1010 low-carbon steel to stainless, including numerous nonferrous.

EVERY SQUIRT A GASKET—You now can squirt the proper size gasket on component parts requiring them with a new material developed by Dewey & Almy Chemical Co. Applied as a liquid, synthetic rubber or resin compound, the material is forced through a nozzle onto a spinning part, then baked to form a solid rubbery gasket that will not fall off the component. Application can be semiautomatic or automatic at rates up to 300 parts per minute—depending on size of parts. Chief advantages over conventional gaskets are lower cost, faster application, better sealing and less stocking. The company says specially formulated compounds can be made to provide effective seals against moisture, oils, gasoline, heat, pressure, vacuum and vibration.

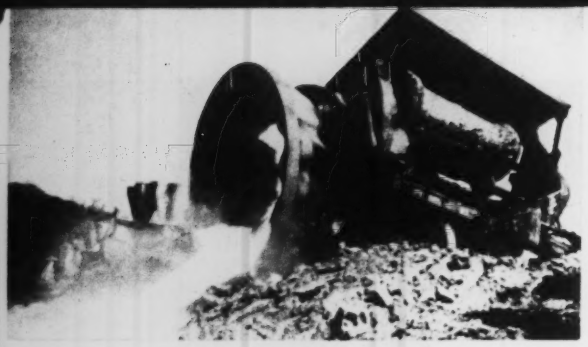
IMPACT OF VACUUM PUMPS—Giant vacuum pumps that can expel all but one molecule of air in every billion are bringing about many changes in industry, according to *Steelways*. Because of high vacuums now attainable life of television picture tubes has been increased 500 per cent. High vacuum deposition of metal plating on plastic, glass and sheet materials is creating new markets in many fields. Recent tests of vacuum-melted steel by antifriction manufacturers show that it may have up to 300 per cent greater resistance to fatigue than the same grade of steel from a conventional melt. With vacuum pumps, water can be vaporized from solid ice; metals that can only be melted at atmospheric pressure can be made to boil; and beams of electrons can be directed in straight lines because they don't collide with gas molecules.

METALWORKINGS—Installation economies derived from gas-fired unit heaters (p. 94) saved one company 49 per cent of the estimated cost of their new plant's heating system . . . Ion exchange process (p. 96) offers a new hope for waste recovery. Salvage is attractive both for re-use of constituents and to ease load on plant waste treatment . . . By machining both jet cone ends in one setup, a new lathe specially designed for Ryan cuts machining time markedly (p. 100) . . . Something like 3 tons of mill scale are recovered every hour at a midwestern steel producer's hot strip mill (p. 102). Three collectors do the job, dewatering the scale, then sending it on for sintering . . . High pressure jet system of lubricating a cutting tool is still in the works. Latest guinea pig; soluuble oil.

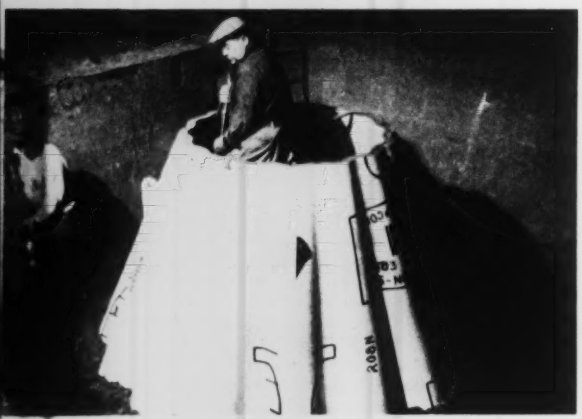
Metalworking Outlook—p. 53 *Market Outlook—p. 147*

CREATING A "THIMBLE"

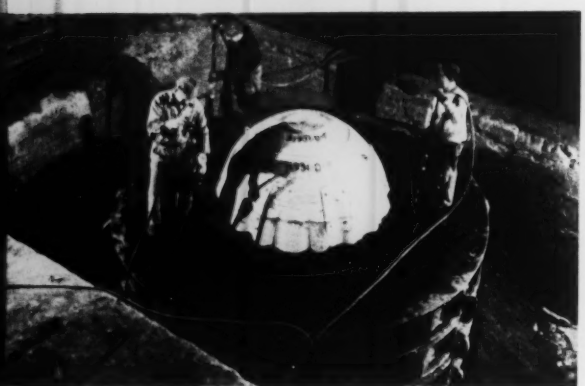
Cinder pot manufacturing requires a series of specialized foundry operations. Better design, improved operating procedures help keep them in action—carrying molten slag at temperatures up to 2900° F



1 NOT AN accident. It's a cinder pot in action—belching forth 10 or 15 cu yd of red-orange molten slag which it received from a blast furnace at 2900° F. Pot making at Mackintosh-Hemphill begins with a wooden pattern similar to the one below . . . .



2 THE PATTERN—as set in casting pit over a core arbor in the cast retaining ring. Air hammers do the mold sand packing to form core. Core arbor, perforated hollow cast steel cone filled with coke, serves as the vent for the core . . . .



3 SILICA facing sand is used to cover pattern surfaces—inside and out. Note how flasks are added as rammed sand is built up around pattern in cope half of mold. Smaller diameter flasks are used above level shown in the view above . . . .

THOSE CINDER pots, often referred to as thimbles by steelmen, nowadays last longer. They last longer in spite of the terrific beating they take daily in carrying molten slag from open-hearth and blast furnaces at temperatures around 2900° F—above the melting point of iron and steel; and in spite of the omission of heat resistant linings that are extremely difficult to keep in place when the pots are tipped for emptying.

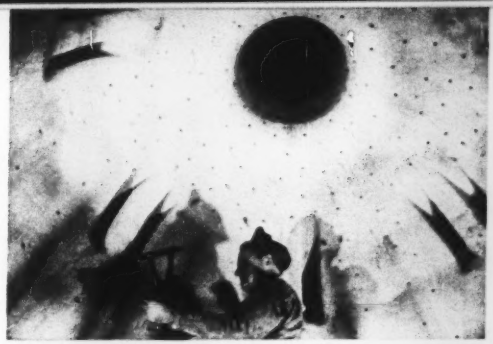
Important reasons for longer service are: Better design and improved operating practices of "housekeeping"—even though new conditons have combined to intensify the attack on the anticipated life of a cinder pot.

Punishment Greater—Today, not only are the pots absorbing the added beating of furnaces operating over rated capacity and holding the hot metal on cars until enough cars are gathered to form long trains, but they are getting larger. Some of the Johnson cinder pots now exceed 500 cu ft, and are made in an oval instead of round shape to meet railroad clearances and furnace column limitations.

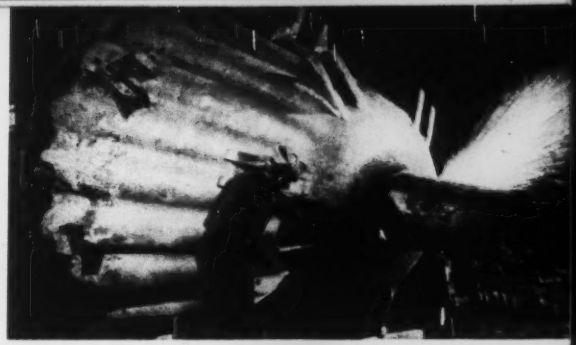
Manufacture and growing use of corrugated steel cinder pots developed over a period of years beginning in 1934. Some improvements include:

Copper coating the inside bottom portion of the pot to make dumping and skulling easier by preventing entrained metal from fusing to the bottom; use of the expansible rim to keep the top of the pot in a true circular shape; introduction of the convex curved side of the cinder pots which both retards thermal inward creeping of the walls without sacrificing other features, and avoids use of over-thick walls that tend to crack and check because heat radiation is retarded.

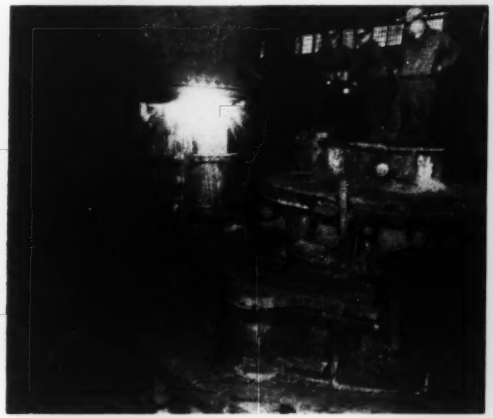
Producing the cinder pots is a series of foundry operations. It starts as a complete, full-size, solid wooden pattern. Accompanying photos show some of the operations involved in making the thimbles at the Midland, Pa., plant of Mackintosh-Hemphill Co.



4 AFTER pattern is rammed, cope half is lifted off and pattern removed. Core then is dried for 36 hours before going to casting pit. Cope half and core are finished the same way. Nails are inserted in cope half here to prevent sand erosion by molten steel . . . .

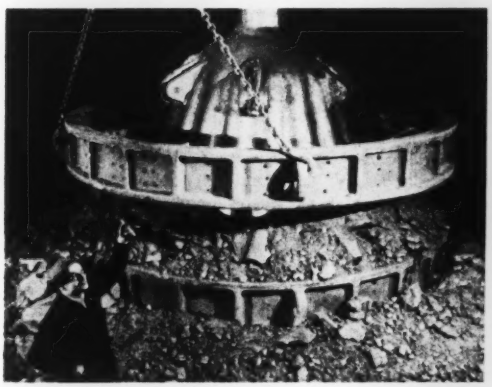


7 ACETYLENE torch is used to burn off riser. Gates were burned off just prior to this operation. The remaining riser stub is ground off to the contour of the pot by powered hand grinding wheels. The next operation is annealing . . . .



5 TEN TO 50,000 pounds of steel are needed to make "thimbles" in capacities up to 500 cu ft. Pouring takes approximately 2 to 3 minutes. Stream of molten steel divides in opposite directions in the wall near bottom of mold. Large pots take 50,000 lbs of steel . . . .

8 ANNEALING for internal stress relief takes approximately a week. A carbon steel having properties best suited to cinder pot service is used. The pots have curved sidewalls to improve their ability to withstand punishing severe service . . . .



6 AFTER cooling, flasks are removed from cinder pot castings (usually 24 hours after pouring). Handling is by overhead crane. The castings are rough cleaned with pneumatic chisels. Large riser is used to supply molten metal to the cooling casting . . . .

9 THIS IS how pot rims are sawed to permit thermal expansion and contraction without permanent distortion. Just before this sawing operation, a copper coating is applied on the vessel bottom to minimize sticking of material in the pot

Friction sawing is coming into its own in many production sawing jobs. Basically it's the same principle as the hot knife in butter

By M. A. BERGSON
Engineer, Machine Tool Division
DoAll Co.
Des Plaines, Ill.

Friction sawing sheet steel panels. In some cases it can be cut at the rate of 140 linear feet per minute

Band Saw Walks Through Metal

STILL REGARDED in some metalworking circles as a novelty or an unknown, friction sawing continues to prove itself a solid production tool. Its rate of cutting is so rapid that in some cases where it is being used, it has brought about a complete revision of concepts as to what constitutes maximum production.

Far more widely known is that operation called band sawing. This method employs a cutting tool consisting of a continuous and flexible strip of alloy steel with cutting teeth on one edge. This band is carried on the periphery of two wheels revolving in such a direction as to afford efficient and continuous cutting action.

Goes Part Way—Friction sawing goes just about that far with conventional bandsawing, but there the similarity ends. While the conventional method relies on cutting action of the band teeth, friction sawing utilizes frictional heat generated between the band teeth and material when the band is moving at high speeds in the range of 3000 to 15,000 fpm.

This frictional heat raises the temperature of the material directly ahead of the band to approximately forging temperatures where it is soft and relatively plastic. Naturally the teeth bite more easily into the softened material virtually scooping the material from the saw slot.

Cuts Dull—Because the material is softened tooth sharpness is not a prime factor in cutting rate and a saw band can cut rapidly through the work even with dull teeth.

Friction sawing, where it is desirable to create heat, is in direct contrast to the conventional technique where it is desirable to keep the tool and material as cool as possible for retention of tooth temper, sharpness and cutting efficiency.

Tell-Tale Chips — Difference in the two methods can be observed in the chips produced by each method. A sharply curled chip, the result of a shearing action, is produced by conventional sawing. That produced by frictional sawing is a shorter, more stubby chip with less curl and with pronounced cracks and wrinkles. Its form is what would be expected from the cutting of a softened material.

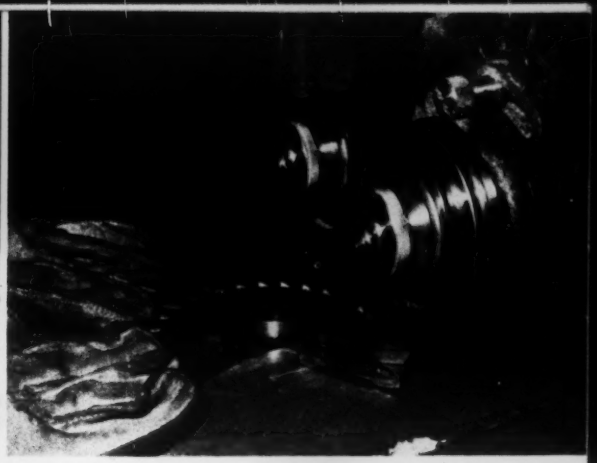
It can't be denied that sharper teeth provide better cutting action even in friction sawing, but this sharpness is not a critical factor affecting cutting rate. The teeth of a friction saw band, dull or sharp, serve two functions. First, they are extremely efficient generators of heat. Second, they serve to remove the softened material as fast as softening takes place. Rapid cutting is assured, reducing the amount of feed pressure required and reducing burr to a minimum.

Multiplier—Teeth of the saw are efficient heat generators because they multiply the efforts of the feeding force into the high unit pressures necessary for quick heating. For example, when a saw is in engagement with a piece the feeding pressure applied is impressed only on those small areas of the piece that are in contact with tips of the teeth. If the total amount of area contacted by the teeth is one-fifth of the piece thickness the effective pressure in terms of work accomplished is five times actual feed pressure.

Thus if a feeding force of 30 pounds is applied against the piece, the effective pressure is 150 pounds. Paradoxically, if a smooth edge band were in engagement with a piece applied at a pressure of 30 pounds, the effective pressure would be just 30 pounds. In this way the point contact afforded by the teeth is advantageous in obtaining the pressures necessary for quick generation of frictional heat.

Calls for Speed—Fast cutting is a requisite for effective friction sawing. Too slow a cutting rate allows the heat to penetrate more deeply through the material, often destroying desirable metallurgical

Friction sawing method for foundry. It's a fast way to remove the gates and risers from rough castings



Splitting a milling cutter with friction sawing. With this method band cuts materials harder than itself

characteristics of the metal. Undue penetration of heat can burn the metal or ruin its temper, or in the case of such alloys as stainless steel, can ruin its corrosion resistance.

Where cutting is rapid the point of intense heat moves along so quickly that there is no time for heat penetration. Selection of the proper saw band and operating factors can assure this rapid cutting minimizing heat damage to the material.

Nonferrous Question—Friction sawing is not ordinarily recommended for nonferrous metals because they are free machining and are readily cut in the conventional manner. Also a better cut finish is usually obtained with conventional sawing so it is more expedient to use this method on free-machining materials and achieve both good cutting rate and finish at the same time.

Also because of comparatively low melting points of nonferrous metals there is a tendency for the softened metal to weld to the walls of the slot, further reducing quality of cut finish and increasing the amount of clean-up machining required. However, under certain conditions and on certain nonferrous alloys, friction sawing is sometimes recommended.

Case of Selection—Characteristics incorporated into the friction saw band are carefully selected to overcome rigors encountered in friction sawing. Teeth must be of extreme hardness for cutting efficiency and wear resistance. This hardness also holds the set tooth more rigidly and affords a more strongly anchored tooth that can resist the violent impacts encountered with friction sawing.

It's also necessary to safeguard band flexibility. This is done with special analysis steel, heat treated to assure long flex life. Gullets are shaped for fast removal of metal and to prevent jamming of the metal in the gullets.

Angle of set of the teeth is carefully chosen and maintained to give proper clearance and cutting performance.

The Limit—Because of concentration of heat required for softening the metal, friction sawing is not recommended for materials over 1 inch thick. Dimensions of the object may be considerably

MATERIALS	Saw Velocity Work Thickness			Saw Pitch Work Thickness			Approx. Lin. Cutting Rate (in. min.) Work Thickness				
	1/16"-1/4"	1/4"-1/2"	1/2"-1"	1/16"-1/4"	1/4"-1/2"	1/2"-1"	1/16"	1/4"	1/2"	3/4"	1"
Carbon Steel (S.A.E.) 1010-1095	6,000	9,000	12,500	14	10	10	1400	60	30	8	6
Manganese Steel 1330-1350	6,000	9,000	12,500	14	10	10	1200	55	25	7	5
Free Machining Steel X1112-X1340	6,000	9,000	12,500	14	10	10	1400	60	25	7	5
Nickel Steel 2015-2515	8,000	12,000	14,000*	14	10	10*	800	45	20	5	3
Nickel Chromium Steel 3115-3415	8,000	12,000	14,000*	14	10	10*	800	45	18	5	3
Molybdenum Steel 4023-4820	8,000	12,000	14,000*	14	10	10*	1000	50	20	6	3
Chromium Steel 5120-5150	8,000	12,000	14,000*	14	10	10*	800	45	18	5	3
Chromium Steel 51210-52100	8,000	12,000	14,000*	14	10	10*	800	40	15	5	3
Chromium Vanadium 6115-6195	8,000	12,000	14,000*	14	10	10*	700	40	15	5	3
Tungsten Steel 7260-71360	8,000	12,000	14,000*	14	10	10*	600	38	12	4	3
N. E. Steel 8024-8949	8,000	12,000	14,000*	14	10	10*	800	45	20	6	3
Silicon Steel 9255-9260	8,000	12,000	14,000*	14	10	10*	600	45	16	4	3
Armor Plate	7,000	10,000	13,500	14	10	10	1200	60	30	6	5
Stainless Steel	7,000	10,000	13,500	14	10	10	1200	60	30	8	6
Illium	8,000	12,000	15,000*	14	10	10*	600	35	12	3	2
Cast Steel	7,000	10,000	13,500	14	10	10	1000	50	16	7	5
Gray Cast Iron	7,000	10,000	13,500	14	10	10	1000	55	20	7	5
Malleable Cast Iron	7,000	10,000	13,500	14	10	10	1000	55	20	7	5
Meehanite Castings	7,000	10,000	13,500	14	10	10	1000	55	20	7	5

* USE ROCKING TECHNIQUE ON MAXIMUM THICKNESS

Operating factors employed in cutting various ferrous materials of different thicknesses. Cutting rates expected are shown in right hand columns

more than 1 inch thick but not more than 1 inch of solid material should be encountered by the saw band for effective results. Tubing, for instance, could be well over an inch in diameter and still have less than an inch of metal in contact with the band.

Thicknesses somewhat over the inch mark can be sawed when the rocking technique is used. With this method the material is rocked against the saw band so there is less than 1 inch of solid material in contact with the band at any given moment.

Like Butter—Within the range of thickness covered by friction sawing, cutting rates are unbelievable high. For example, carbon steel, SAE 1010-1095, 1 inch thick can be cut at the rate of 6 inches per minute. On ferrous sheet metal the friction saw band literally races through the material, cutting faster than a man can feed by hand. Sheet steel 1/16-inch thick can be cut at the rate of 140 linear fpm.

Friction saw bands cut through steels even harder than the bands themselves. They cut such items as files and milling cutters.

Other Uses—For shape cutting of sheet metal such as needed in the manufacture of passenger bus bodies friction sawing will prove the highest production method. It lends itself to cutting of structural shapes such as I-beams, and square forms. It's also coming into use in foundries since it permits faster removal of the gates and risers from ferrous castings particularly the chrome-nickel types.

Optimum results in friction sawing operations are dependent on the selection of correct operating factors, such as proper band, correct pitch of the band, band width, velocity and feed.

Consult Maker—Choice of these factors is dependent on the nature of material to be cut, its thickness, finish desired in the completed cut and production rate. Saw band manufacturer's recommendations should be observed for best results.

Growing practice of friction sawing, the high band speeds required and the variety of band speeds needed for obtaining optimum results on different kinds of materials has prompted the development of new band machines suited for the work.

HEATING INSTALLATION COST CUT IN HALF

By ROBERT B. RICHARDS
Commercial Engineer
Kings County Lighting Co.
Brooklyn, N. Y.

Employee comfort, lower fuel bills and adaptability of the system to future expansion are other benefits of unit heater installation in commercial machine and tool shop

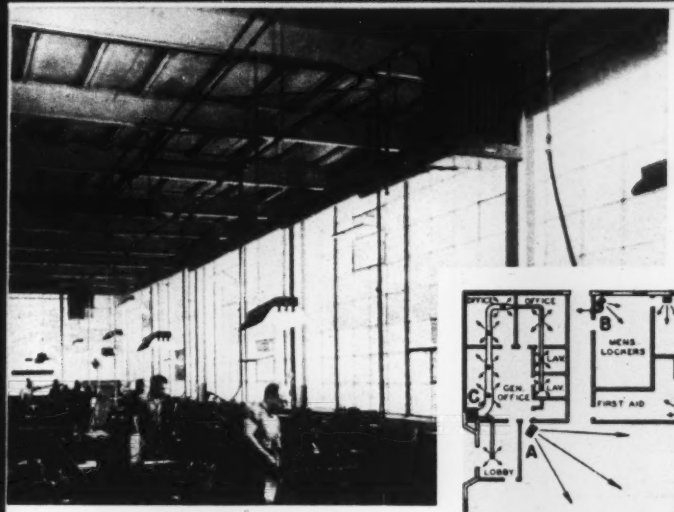
TAKING advantage of the installation economies possible with gas-fired unit heaters, the proprietors of Vahl Engineering Co., Brooklyn, N. Y., saved 49 per cent of the estimated cost of their new plant's heating system. In addition the greater operating efficiency of gas-fired unit heaters compared to steam unit heaters, permitted annual savings of 17 per cent, even though using the nominally higher-priced gas fuel.

When Vahl Engineering commissioned Brown and Matthews Inc., New York, to build a new manufacturing plant for them in early 1951 they asked the builders to consider most carefully the matter of heating. The company is a commercial machine and tool shop producing machine parts in steel, aluminum and alloys for aircraft and other exacting requirements. Louis and Alfred Schlehlein, partners in the concern, insisted that the facilities of the plant be consistent with the quality of products manufactured. Current construction costs, however, dictated careful scrutiny of all aspects of the project to insure that all possible economies were made, without impairing quality standards.

Requirements Set — Minimum temperature to be maintained during working hours was to be 65°F. For operating cost calculations, it was assumed that this temperature would be maintained for 10 hours per day for 5 days and 8 hours for the sixth day, a total of 58 hours per week. Temperature was to be maintained at 45°F during nonworking hours, totaling 110 hours per week. Total heat loss for the plant was calculated at 1,120,000 Btu/hr.

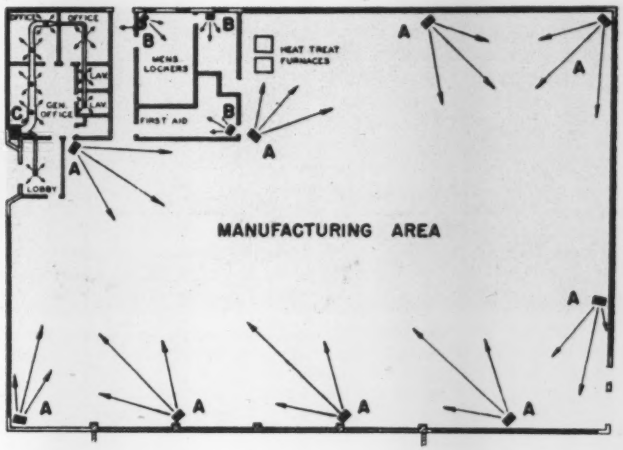
Although the contractors previously used oil-fired boilers with steam unit heaters for practically all of their plant construction jobs, the advent of natural gas to the metropolitan area caused them to consider the feasibility of using gas-fired unit heaters for this project.

Installation Cost — Consultation with the industrial and commercial heating specialists of Kings County Lighting Co., the local gas utility, disclosed that a complete heating system based upon the use of Janitrol gas-fired unit heaters



Southeast end of shop showing large glass area that provides excellent visibility for machining operations but affords poor heat insulation

Floor plan of manufacturing, office and locker room areas. Heater capacities are: (A) 125,000 Btu/hr, (B) 50,000 Btu/hr and (C) 120,000 Btu/hr



for the factory area and a Janitrol forced air conditioner for the office area, could be installed for about $7350.

On the basis of standard costs and practices in the area, the contractor estimated installed cost of an oil-fired steam boiler unit heater system at about $14,340. This figure would include the cost of the boiler plus the unit heaters as well as the construction of a utility room, with stack, to house the steam generating equipment.

Take a Closer Look—Although oil sells at a considerable lower rate per therm in the metropolitan area, the greater efficiency of gas-fired unit heaters was estimated to permit an annual fuel cost saving of $300. According to the builders' original estimates, annual heating costs for the oil-fired boiler and steam unit were $2100 (based on the use of 20,000 gallons of No. 5 fuel oil at $0.105/gal.). The industrial and commercial heating department of the utility calculated the annual heating cost with gas-fired equipment to be $1800.

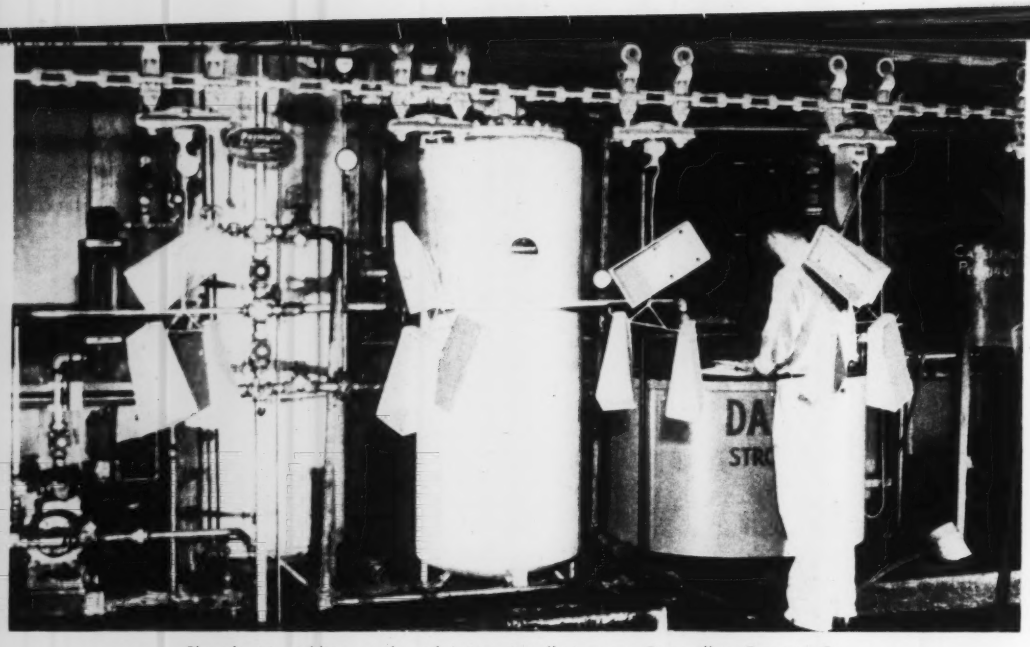
On the basis of fuel costs for the 1951-52 season, this estimate has been substantiated. Exact determination of the space heating costs is impractical due to the fact that the plant also draws gas for heat treat furnaces and a water heater from the same meter which services the space heating equipment.

Gains and Losses—Vahl's new plant follows modern ideas in its one-floor construction with a high percentage of wall space taken up by windows, as shown in the illustration. These sweeping areas of glass make maximum use of natural light for precision machining operations. However, these same expansive areas of single-thickness window glass materially increase winter heat losses. The well-known high thermal conductivity factor of glass creates problems in providing comfortable winter temperatures throughout the plant.

Gas-fired unit heaters are extremely well-adapted to plants of this particular construction. The heaters are suspended from the ceiling and can be located to maximum heating advantage without taking up floor space more useful for production machinery. Moreover, the heat can be directed by louvers to the required areas.

Expansion Considerations — In plants where exhaust steam is available, steam unit heaters often are the economical means of space heating. However, this installation where steam is not otherwise used, would entail inefficient operation of the boiler at a small per cent of its rated capacity during the off-peak heating season. If the plant should be expanded, the increased heating load would be more readily handled with additional gas-fired unit heaters than replacing or increasing the existing boiler capacity.

Management is pleased with the comfort and economy of these unit heaters. They have been particularly gratified with the employee reaction—no complaints due to cold areas or drafts anywhere in the plant. Heat-up in the morning is rapid. Winter working conditions provide the comfort necessary for precision machine work. A useful lesson is that a premium-priced fuel such as natural gas can be the most economical fuel in a well-engineered industrial heating installation.



Phosphoric pickling and reclaiming installation at Caterpillar Tractor Co. Ion exchange resin is in tall tower at left. Center unit supplies soft water

Ion Exchange— New Hope

Doubled-barreled value offered for metal treatment solutions. Recovery of spent baths and metals for re-use also eases waste disposal problems

By DR. ALLEN G. GRAY
Technical Editor

METAL TREATMENT operations generally give spent baths and rinse waters containing metals, acids and other chemicals somewhere along the line.

Salvage is attractive, both for re-use of constituents and to ease the load on plant waste treatment. Recovery and purification may be feasible at lower cost than disposal.

Ion exchange processes open the door to new developments in the recovery of metals. Applications in metal processing are: 1. Purification of baths used in electroplating, anodizing and stripping. 2. Regeneration of spent pickling baths. 3. Recovery of metals and chemicals from rinse waters.

How They Work — Cation and anion exchangers are insoluble granular or bead-like compounds. They are generally used in percolation type equipment. Ion exchangers give up an ion from their structure for one in the solution being treated. The exchangers are used until their ability to do this is exhausted. Regeneration is accomplished by contacting the exhausted exchanger with a suitable chemical depending on the process.

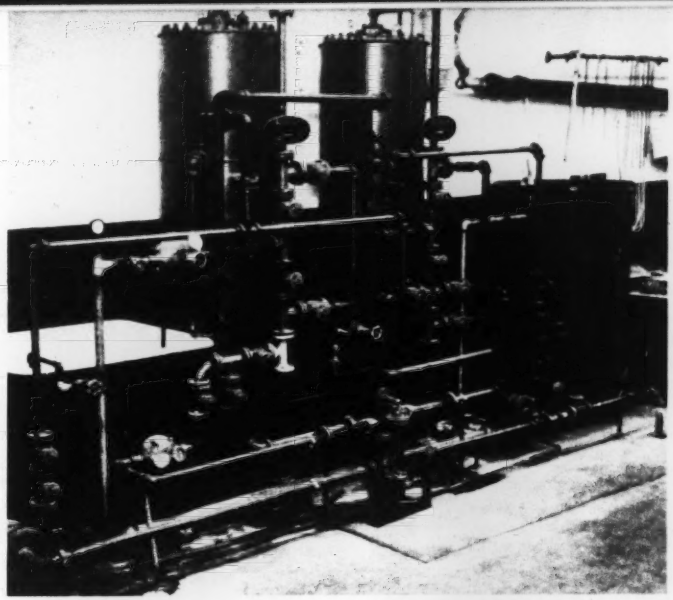
One group of so-called cation exchangers consists of inorganic siliceous materials. These are usually regenerated with solutions of salts and are mainly used where the pH of the solution falls between 6 and 8. This type is widely used in water purification.

Organic ion exchangers may consist of processed naturally occurring material or synthetic resins. These materials may be regenerated with salts, acids, or alkalies and are used to treat solutions in a relatively wide pH range. Organic cation exchangers are of value for removing objectional metals from plating, anodizing, and pickling baths.

Anion exchangers utilizing resins which react either as strong bases or weak bases are also available. Highly basic anion exchangers recover the chromate-ions from rinse waters in chromium plating and chromic acid anodizing and hold the cyanide and copper complex from copper plating rinse waters. Sometimes it is desirable to use a combination of a hydrogen (cation) exchanger and an anion exchanger for recovery operations.

Phosphoric Acid Pickling — Ion exchange is used at Caterpillar Tractor's, Peoria, Ill., plant to continuously purify and reclaim phosphoric acid pickling solution. Sulphonated polystyrene cation exchange resin, Permutit Q, takes up dissolved iron from the pickling solution substituting hydrogen ions.

Phosphoric pickling produces a thin rust resistant phosphate coating on steel parts. The base metal is not so strongly attacked as is the case with sulphuric acid pickling. Less rinsing facilities are



Ion exchange installation for chromate recovery in plating operation. All chromate drag out is saved for re-use. None goes to waste treatment

For Waste Recovery

also required. A solution of 15 to 50 per cent phosphoric acid in water is generally used. Various commercial phosphate coating processes utilize a solution capable of producing a much heavier phosphate coating than is obtained by acid pickling.

During the pickling operation, phosphoric acid reacts with rust and mill scale to form iron phosphate. In the reclaiming process, the acid is pumped directly from the pickling tank through a unit containing a hydrogen cation exchange resin. This resin has the property of releasing hydrogen ions and taking-up iron ions in exchange from the acid solution. The resin thus effectively absorbs the dissolved iron from the pickling solution and converts the iron phosphate back to phosphoric acid. Reactions which take place are given below, where the symbol Z designates the ion exchange resin.

$$Fe_3(PO_4)_2 + 3HZ \rightarrow 3FeZ + 2H_3PO_4$$

When the exchange medium becomes exhausted and no longer removes iron, the flow of pickling solution is stopped and the ion exchange unit is washed out with the wash water going into the pickle batch. Periodically, on night shift when the line is down, the unit is backwashed with sulphuric acid to give hydrogen ions back to the resin restoring it to the orginal condition. Iron ions previously absorbed from the pickle solution form iron sulphate and are discarded as waste. After proper rinsing, the unit is again ready to treat the phosphoric acid pickling bath. Chemical reactions for the exchange resin regeneration are given below:

$$H_2SO_4 + FeZ \rightarrow H_2Z + FeSO_4$$

In actual operation, the purification process is used to maintain the metal content of the bath at the optimum point, rather than to remove all of the iron. The most satisfactory surface treatment results when there is a substantial quantity of iron dissolved in the solution. However, if the iron content is too high the pickling operation becomes too slow. An iron content of 2 to 3 per cent (as ferrous) in a 40 per cent phosphoric acid solution appears to be most suitable for processing cold rolled steel.

In practice, only a portion of the total pickling solution is passed through the resin exchange unit to remove the iron. This treated portion is returned to the pickling bath to mix with the remainder of the pickling solution and lower the overall iron content. Flowsheet of a phosphoric acid pickling system, illustrated, show both the recovery and regeneration setup. The equipment for purification can be installed in existing pickling lines.

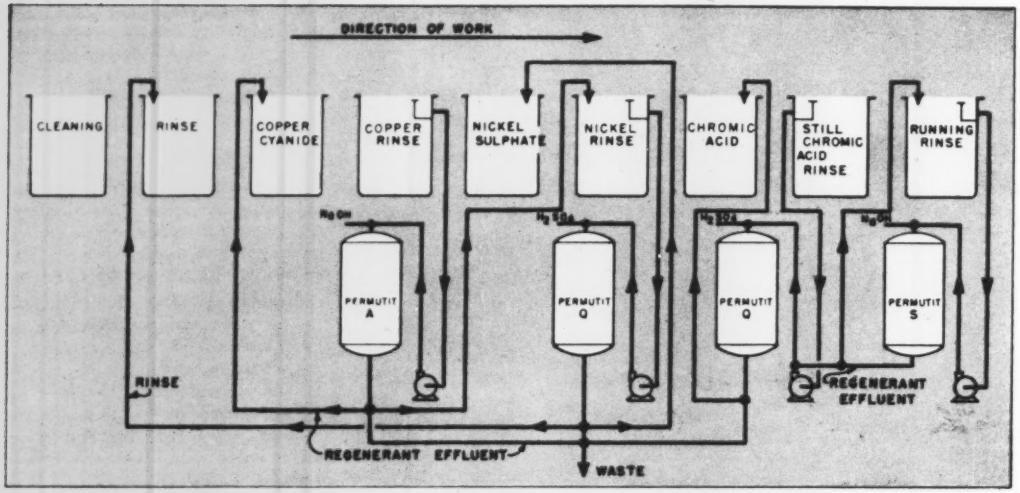
Cleaning-up Baths—Ion exchange resins will purify chromic acid baths used for anodizing aluminum. In anodizing, about as much aluminum is dissolved as is converted to the corrosion resistant oxide coating. Side reactions also produce undesirable trivalent chromium.

Build up of such impurities interferes with the anodizing operation. It is possible to run an anodizing bath up to an aluminum concentration in the range of 12 g./L. Al_2O_3, but the bath must then be adjusted by dumping or by draw-off and partial make-up. Practice has been to discard a portion of the waste and add additional chromic acid. Such intermittent dumping gives a high chromate content in the plant waste treatment system.

Saves Dumping—With ion exchange methods, it is no longer necessary to dump the baths. A portion of the solution can be treated each day to yield a constant and optimum bath concentration for the anodizing operation. The used resin is then regenerated with sulphuric acid.

Chromic acid type anodizing baths are generally made up in concentrations ranging from 30 to 150 g./L. These baths can usally be treated by cation exchange for aluminum removal without prior dilution. Ion exchange resins are relatively stable in chromic acid solutions up to 150 to 200 g./L., but decompose when exposed to higher concentrations. For some applications, such as purification of chromic acid plating baths, it may be necessary to dilute the solution before it passes through the resin bed.

On the Record—The results of plant tests reported by D. M.



Layout showing an ion exchange system that is suitable for use in the recovery of rinse water from a copper-nickel-chromium plating operation

Stromquist and A. C. Reents, Illinois Water Treatment Co. before the Purdue Sixth Industrial Waste Conference showed that in the case of a 100 g./L. chromic acid anodizing bath containing about 7 g./L. of Al_2O_3, the aluminum concentration during the ion exchange purification was held to less than 0.02 g./L. In another case cited, 2000 gallons of a 100 g./L. concentration chromic acid anodizing bath, containing 10 g./L. of Al_2O_3 build up, was purified by a single batch treatment using 120 cu ft of styrene type cation exchange resin.

Tests conducted by R. L. Costa[1] of Mutual Chemical Co. showed that sulphonated cross-linked polystyrene cation exchange resins such as Permutit Q, Amberlite IR-120, and Dowex 50, remove metallic contaminants from used chromic acid solutions. The resin was not affected at chromic acid concentrations below 150 g./L. The average results obtained in a series of 100 test runs made to regenerate a spent 72 g./L. chromic acid anodizing solution obtained from a large anodizing plant showed that the initial Al_2O_3 content of 7.7 g./L. was reduced to an average value of 1.5 g./L.

For these tests, an experimental ion exchange column was set up, calculated to treat one gallon of the anodizing bath and approximately exhaust the resin in each cycle. The column was 1.5-inches in inside diameter and 60-inches high. The resin bed depth was 39-inches, or 0.04-cu ft, as backwashed and drained. The flow rate for service, rinse, and regeneration was 100 ml./min. Rinsing after regeneration was continued until the effluent was free of sulphate. The regenerant used in each cycle was two gallons of 7 per cent sulphuric acid. During the 100 test runs there was no noticeable deterioration of the ion exchange resin, either in appearance or chemical behavior.

Chromium Plating Baths—Chromic acid plating solutions used in hard chromium or decorative plating are generally made up to a concentration of 250 to 400 g./L. chromic acid. A certain concentration of sulphate, usually about 1 per cent of the chromic acid content, has to be maintained in order to plate properly. These plating baths may build up metal contamination as they are used, due to the action of chromic acid on the parts being plated and resultant metal pick up. This contamination is generally present in the form of iron, copper, zinc, and other metals.

In the past, practice has been to adjust or dump the plating bath when the concentration of metal contaminants reached 10 to 15 g./L., or when faulty, spotty plating evidenced by nodules or a fine grain structure occurred. Increase in current density to a prohibitive value is another criterion used to determine whether or not a bath is to be discarded, but this is generally not watched as closely as the quality of the plating.

Latest Way—New method is to use a cation exchange resin to remove undesirable metal contaminants from the bath. However, high concentration chromic acid baths must be diluted before treatment to increase the effective capacity of the resin and to minimize chemical attack. In many processes, where water addition is necessary to make up for loss by evaporation, diluting water is added to that portion of the solution withdrawn for treatment with the resin, thus accomplishing two purposes at once.

The ion exchange treatment may be done periodically, regenerating the complete contents of the tank needing treatment, or a small portion of the bath may be treated daily, so as to maintain a nearly constant, predetermined concentration of all components, thus minimizing the size and cost of the

necessary treating equipment.

In laboratory tests conducted by R. L. Costa, previously referred to, purification runs were made on a simulated chromium plating bath containing 400 g./L. chromic acid, to which were added 25 g./L. copper oxide and 28.6 g./L. iron oxide as contaminants. When the test bath was diluted to 150 g./L. chromic acid, about 75 per cent of the dissolved metal contaminants were removed. At a dilution of 100 g./L. chromic acid, almost quantitative removal of the metal contaminants was obtained.

Copper Stripping Baths — Chromic acid solutions used for stripping copper are regenerated by same methods. Laboratory tests using an ion exchange resin column with a copper stripping bath containing 200 g./L. chromic acid and 50 g./L. copper oxide showed good removal of copper from the solution, but the resin was attacked by chromic acid. The test solution was diluted to 100 g./L. chromic acid and 25 g./L. copper oxide, at which concentration the resin removed almost all of the copper with negligible attack on the resin.

Rinse Water Too—Combination of hydrogen exchanger and anion exchanger are used to recover chromic acid from rinse water. However, in most cases, evaporation must be employed to concentrate the chromic acid for re-use. Anion exchange has been developed by the Permutit Co. to recover chromate from rinse water for re-use. In operation, the rinse water is passed through a bed of Permutit S, a basic resin. The resin is then regenerated with caustic soda. A Permutit Q hydrogen exchange resin unit is used to recover chromic acid from the sodium chromate solution.

Amberlite IRA – 410, a strongly basic ion exchange resin, produced by Rohm & Haas Co. is also used for recovery of chromate.[2] The resin is regenerated with caustic soda. Passage of spent caustic regenerant through a strongly acidic cation exchanger may cheaply recover the chromate in concentrated form for recycling to the plating tank.

Plating Waste Recovery—Recovery of plating wastes may be feasible at lower cost than disposal. Layout of ion exchange system suitable for recovery of rinse water from copper-nickel-chromium plating operation is illustrated. This treatment system solved a difficult disposal problem.

Demineralized water is used for making up all baths and for copper rinse. The copper rinse, containing the copper as an anion cyanide complex, is pumped from the overflow of the rinse tank through a bed of a highly basic anion exchanger, such as Permutit S, which will hold the cyanide and copper complex. The effluent of this unit contains hydroxide equivalent to anions removed. The run is halted when cyanide breaks through.

Highly basic anion exchanger is regenerated with caustic soda and the regenerant effluent, which contains the copper cyanide complex, is returned to the plating bath. Any regeneration rinse waters, which might contain cyanide are given a chlorine treatment to insure freedom from toxicity.

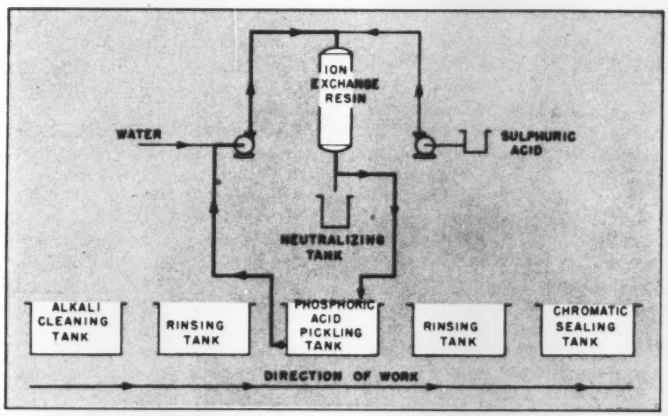
Rinse waters from the nickel rinse go to a bed of cross linked polystyrene ion exchange resin, such as Permutit Q, where the nickel is removed. Upon regeneration with sulphuric acid, this cation exchange unit gives a solution which can be returned to the plating bath.

The chromate recovery system is a completely closed system. The concentration of chromate in the still rinse is allowed to rise to about 10 per cent. At frequent intervals, this still rinse is passed through a cation exchange unit to remove metal contaminants that gradually build up in the plating bath during use. Occasionally, part of the treated chromic acid is returned to the plating tank. It may be necessary to use an evaporator to concentrate part of the solution.

The running rinse is passed through a highly basic styrene anion exchanger and is then recycled. When this unit is exhausted, it is regenerated with caustic soda and the regenerant effluent sent through the cation exchanger for removal of sodium. The recovered chromic acid is then concentrated by evaporation for reuse in the plating bath.

Throughout the cycle of the two units working on chromate bearing liquors, it is possible to operate in such a manner that all of the solutions containing chromates will go to either the plating bath, still rinse or running rinse and none will go to waste. The regenerant from the cation exchange unit, since it contains metal contaminants, from the bath will go to waste.

Dollar Savings Over Disposal—To determine possible savings in using the above ion exchange system over disposal costs, Permutit Co. made calculations[3] postulated on an annual flow of 2,000 gph of



Flow-sheet of phosphoric acid pickling system showing recovery and regeneration setup. This equipment can be installed in existing pickling lines

rinse water from each of the copper, nickel, and chromium plating operations. The copper rinse water was assumed to contain: 8 ppm copper, 12 ppm sodium, and 14 ppm cyanide. Nickel rinse: 22 ppm nickel, 30 ppm sulphate, 3 ppm chloride. Chromium rinse: 10 ppm chromic acid.

Actual figures arrived at are something like this. Disposal costs $24.50 per day with water consumed valued at an additional $14.40 per day. Ion exchange recovery gave salvaged chemicals worth $3.82 per day and water consumed cost $4.80 per day.

The cost balance from the estimate gives a saving of $3.82 per day over no waste treatment or of $28.32 per day over a conventional waste disposal plant for this copper-nickel-chromium plating operation. According to Permutit, this saving would pay for the ion exchange equipment in 300 working days. Also, since most of the water is reclaimed with the ion exchange process and re-used, the water cost will be reduced from $14.40 to $4.80 per day.

Brass Pickling—Cation exchange resins are applicable to the recovery of zinc, copper and chromium from brass pickling baths. Either the sodium or hydrogen cycle may be used. General feeling is that economics favor the hydrogen cycle, wherein spent acid is recovered for pickle make up. However, if the elimination of toxic metals is of primary concern the sodium cycle may offer advantages.

Save Tin Plating Wastes—Tin may be recovered from sodium stannate solutions used in the alkaline tin plating process by passing rinse waters through a hydrogen cation exchanger which converts the salt to the insoluble metastannic acid. The precipitate may then be concentrated by the sludge filtration principle. The dense flocculant material may then be converted to relatively concentrated sodium stannate which can be re-used in the plating process.

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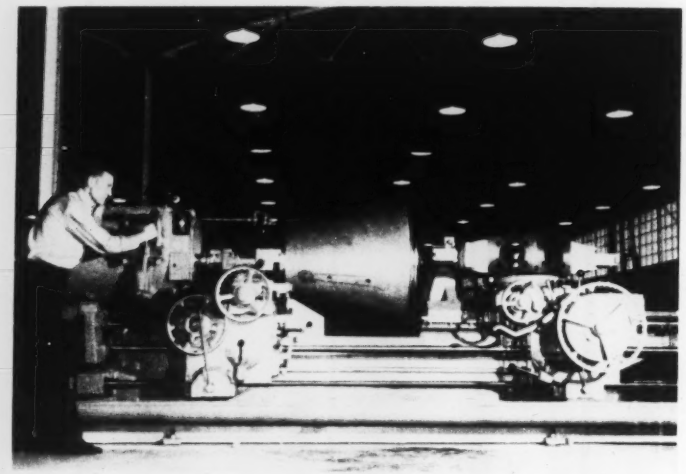
2. H. Gotter and E. F. Thurn, *Metal Progress* (July 1952).
3. C. F. Poulson, "Metal Recovery By Ion Exchange," American Electroplaters' Society, Chicago Branch, May 9, 1952.
4. A. B. Minder, M. E. Gilwood, and G. H. Saunders, *Ind. Eng. Chem.* 43, 1079 (May 1951).

Shell Molding Goes West

Students at Stanford University graduate school of business recently completed a machine to adapt the shell molding process to small foundry operations. They are producing what are believed to be the first shell molds in the West.

The machine's design is simple and could be duplicated easily in any welding and steel fabrication shop.

The castings are reported to have high precision, excellent finish and cost about 30 per cent less than conventional types. Sand and thermosetting plastic mixture form the molds when brought in contact with a hot metal pattern.



ONE OF RYAN'S SPECIAL GAP LATHES
. . . flanges are turned and formed in one pass

Lathe Machines Both Jet Cone Ends in One Setup

TIME required to machine large jet engine exhaust cones is cut markedly with a new lathe specially designed for Ryan Aeronautical Co. Built by Warner & Swasey Co., Cleveland, five more of these gap lathes will be installed at Ryan's San Diego, Calif., plant.

The time-saving tool machines flanges at both ends of the big cones with a single setup. Cutting tools turn and form the flanges to exact dimensions in one pass. The component maker reports these features offer a marked advantage over vertical turret lathes that require two setups and a tool change to accomplish the same result.

Major Modification—To produce the machines, Warner & Swasey engineered a major modification of its heavy-duty lathe to adapt them to engine production. Among necessary features were special tools and tool holders, devised so that the cones could be machined from both ends.

Ryan built the arbor and trunnion, and an electric hoist and swinging crane so one man can load and operate the machine.

High Precision — According to Ryan, the lathe's sturdy construction means high precision as well as good production. The base is a one-piece welded steel foundation with twice the thickness of cast iron. V-bedways are induction hardened to specific depth and hardness to minimize wear.

Drive comes from a 50-hp electric two-speed motor with push-button control. All gears and shafts are hardened and ground chrome-nickel steel, lubricated with cooled and filtered oil. Hydraulic braking system brings the spindle to a fast, smooth stop regardless of speed.

Speed Nut Savings Stories

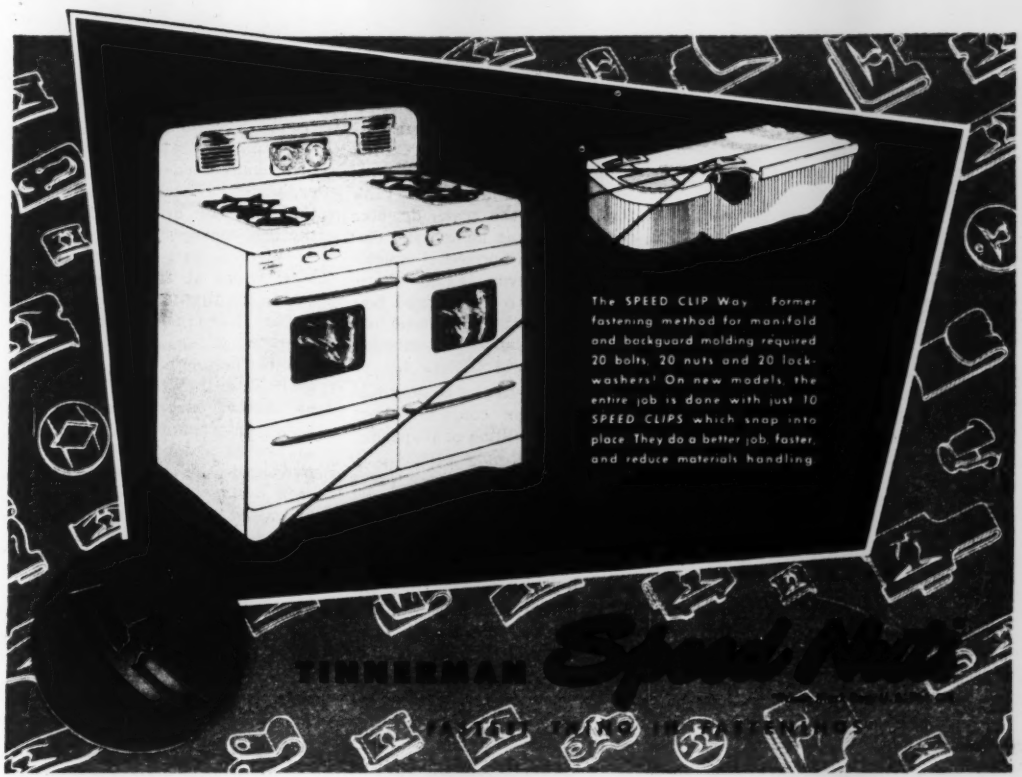
CALORIC STOVE CORPORATION, Topton, Pa...

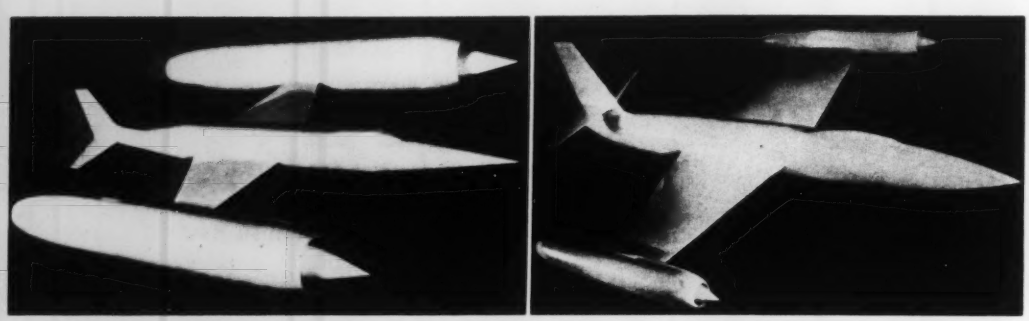
"Cooks up 45% Savings"

...by designing Tinnerman SPEED CLIPS into the New *Caloric* Ultramatic Gas Range!

Engineers at Caloric Stove found a 45% savings in materials and production time by switching to TINNERMAN SPEED CLIPS for better, faster attachments on the new Caloric "Ultramatic"! Former methods for fastening the manifold and backguard molding required 60 parts, including bolts, nuts, and lockwashers. Now... 10 TINNERMAN SPEED CLIPS do the complete attachment job... a tremendous saving in parts and materials handling, plus an amazing gain in production man-hours. Caloric's cost analysis revealed a big 45% SPEED CLIP assembly savings!

Think of this production savings in terms of your own fastening problems. No matter what you assemble or build, it will pay you to turn to TINNERMAN for the answer to better fastening engineering methods... greater production savings! Whether it's a product in the design stages, or an established production item... the SPEED NUT principle of spring tension fastening will help cut costs for you! See the TINNERMAN representative in your area for details on the FREE TINNERMAN Fastening Analysis Service. Or write direct to: TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales. In France: Aerocessoires Simmonds, S. A. — 7 rue Henri Barbusse, Levallois (Seine) France.


The SPEED CLIP Way. Former fastening method for manifold and backguard molding required 20 bolts, 20 nuts and 20 lockwashers! On new models, the entire job is done with just 10 SPEED CLIPS which snap into place. They do a better job, faster, and reduce materials handling.



Hot-Rodding Jets—Afterburners Are the Key

To illustrate the tremendous power required to push planes at supersonic speeds, NACA's Lewis Flight Propulsion Laboratory fabricated this model showing a hypothetical airplane designed to fly at 1350 mph. Without afterburners, a huge powerplant is required to gain sufficient thrust.

In this NACA model, also designed to fly at 1350 mph, engine nacelles can be reduced greatly in relative size because the engines are now equipped with afterburners. Without these thrust-augmenting devices, unwieldly size of the turbojet engines would make the design worthless

Collector System Ups Mill Scale Recovery

Reclamation for sintering reaches 97 per cent under the concentrator-conveyor system. Another advantage results from elimination of the clogged sewer problem

SLUDGE collectors, followed by horizontal and inclined belt conveyors form a system that recovers 97 per cent of the mill scale from a midwestern steel producer's hot strip mill.

Production figures show 3 tons are recovered each hour the strip mill operates. An average 950,000 pounds are reclaimed each week, compared with 500,000 pounds by previous methods. Because this scale is 72 per cent pure iron, each ton is equivalent to 1½ tons of ore.

Another plus feature follows naturally as an effect of increased iron recovery. This is elimination of the clogged sewer problem and possibly means a contribution of note in the efforts against stream pollution.

Down the Drain — Scale is knocked off the steel surface by high pressure water spray as the strip emerges from each of six roughing mills. In the past, much of this oxide formation went down the drain in spite of attempts to reclaim it by diverting the water into sludge pits. From sludge pits, the scale removal job was done by bucket crane—but only about 50 per cent was recovered. The remainder passed untouched into the sewers, causing not only a loss but frequent clogging.

Under the present system, scale flows through covered trenches from the strip mill into the concentrator, where it settles to the bottom. Three Straightline collectors, made by Link-Belt Co., Chicago, travel along the concentrator tank bottom, collect the scale, dewater it, convey it up an incline and discharge it onto a horizontal collecting belt conveyor. From there, scale moves onto an inclined belt conveyor and into a railroad car for transportation to the sintering plant.

Open Sewers—Water coming into the concentrator contains about 3000 parts per million of suspended solids; outgoing, only about 40 to 50 ppm, with seven to ten parts iron.

Because the river water averages about 103 ppm suspended solids, the mill discharge is cleaner than that obtained originally. Thus, the firm no longer wastes a valuable product to cause itself trouble from clogged sewers.

The three concrete concentrator tanks are each 10 feet wide at the top, 5 feet wide at bottom, have a water depth of 9 feet 6 inches and a total depth of 21 feet from operating floor to tank bottom. Tanks are 69 feet long, with an inclined discharge end.

Each collector mechanism consists of two parallel strands of Link-Belt C-110 combination promal and steel chain. Channel steel flights are spaced at 4-foot intervals. Flights have abrasion-resisting wearing flights. An electric motor powers each mechanism.

Directly to Cars—Collector head is supported on a structural steel frame. The inclined trough from the tank's operating floor has 10-inch channel sides and ¼-inch liner plates. Discharge chute with flap gate can divert mill scale to the belt conveyor or to containers. A pivoted and counterweighted steel wiper at the collector head cleans the flights.

The 16-inch-wide belt conveyor operates at about 25 fpm under electric motor power, discharging scale into the loading hopper of an inclined, pivoted conveyor. The latter unit can travel on rails in an arc of about 90 degrees, permitting it to carry scale directly to cars beside the concentrator, yet be moved out of the way for railroad clearance when not in use.

New Dust Filter Booklet

Illustrated dust filter bulletin dealing with all aspects of dust control as achieved by the Hersey-type dust filter was released recently by Day Co., Minneapolis. The firm manufactures automatic-continuous dust filters. Copies are available free from the company.

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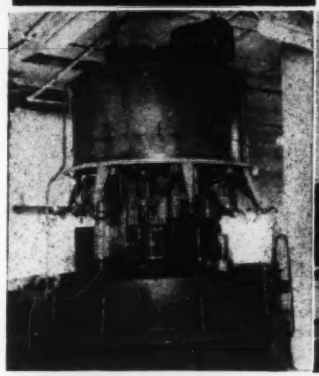
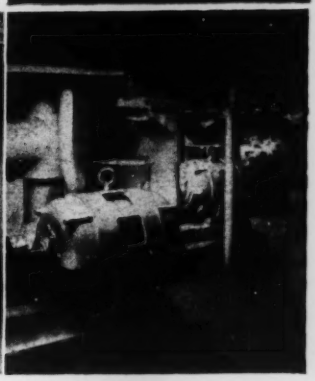
75 Horsepower Century drip proof motor on a copper tube drawing machine.



Century 25 horsepower motor on a large automatic production machine.



Century 125 Horsepower motors on circulating pumps for chilled water. Used in department store.

Here are some typical examples of equipment powered by large Century motors, which were application engineered for TOP PERFORMANCE.

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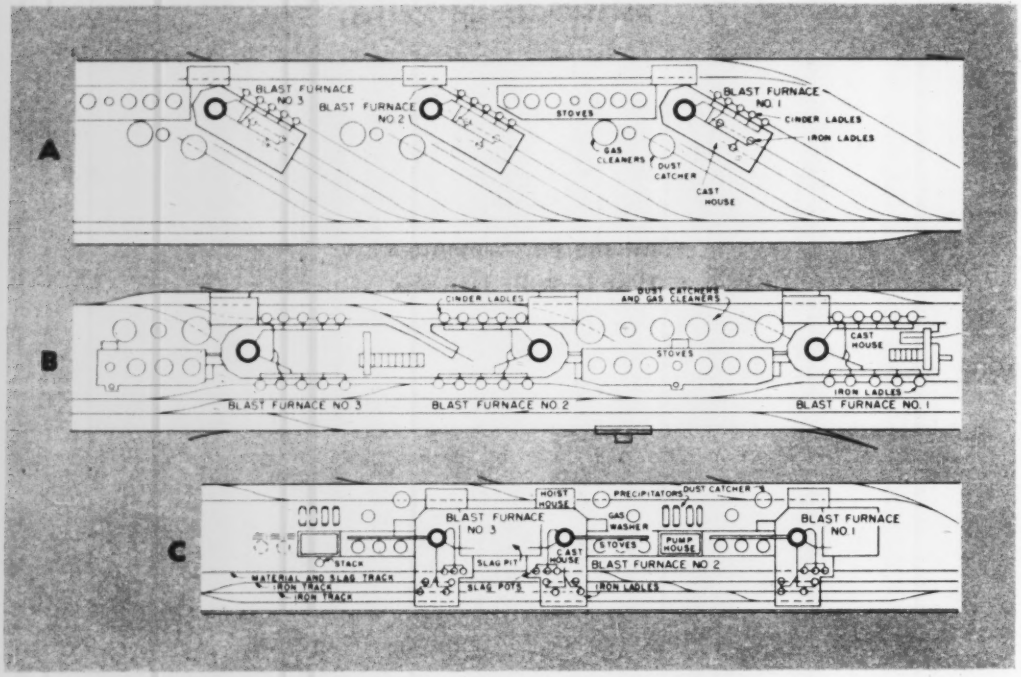

Echelon arrangement of blast furnaces—A. B—Straight line arrangement. C—Crosswise casthouse arrangement

No Drastic Change Seen In American Blast Furnace Design

Arrangement of furnace layout generally follows three patterns. Automatic charging control, pneumatic bell hoists, handling of coke breeze and gas cleaning equipment greatly assist the operator

By OWEN R. RICE
Metallurgical Engineer
Freyn Engineering Dept., Koppers Co. Inc
Chicago

WHERE new blast furnaces are erected as units of an existing plant, it is almost inevitable that the layout conform generally to the already established arrangement of the other furnaces. This may be the echelon (or Gary) layout or the "in-line" arrangement as shown in the accompanying illustration. In both cases, the hot metal and slag tracks run parallel to the casthouse.

Where a furnace is built on a new site, particularly where there is no obligation to connect intimately to existing railway trackage, attention in the United States is being given, and actual installation is proceeding according to what may be called the crosswise casthouse layout, shown in accompanying sketch (C). It is an arrangement similar to that employed in Britain on certain new furnaces. The hot-metal and slag tracks extend crosswise of the casthouse.

The Pay-Off—Advantages lie in through rail lines, in relief from traffic congestion, compact casthouse, economy in plant dimension normal to the line of furnaces. Use of large capacity hot-metal and slag ladles contributes heavily to the feasibility of employing this arrangement.

It is usual practice at U. S. blast furnaces to provide a primary gas washer for each furnace, and to have two furnaces pool their resources with respect to secondary gas-cleaning facilities.

There is a trend toward the

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CARBON-LINED BLAST FURNACES

TYPICAL of the many comments favoring carbon-lined furnaces after the recent strike, was that made by the manager of a large eastern mill.

Describing his carbon hearths as coming back on blast "smooth as silk", he joins the many other users reporting faster, easier, more economical return to normal operation with carbon lined furnaces than with any other type of lining.

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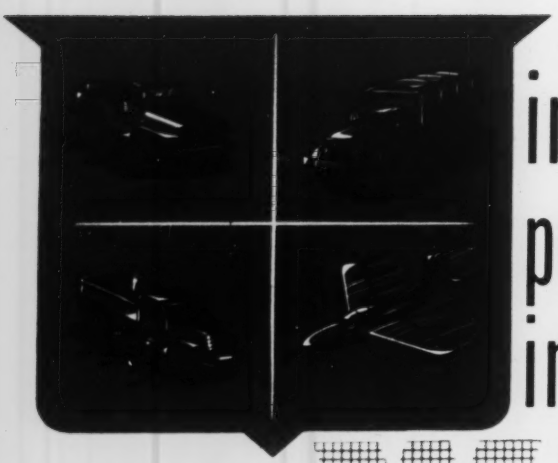

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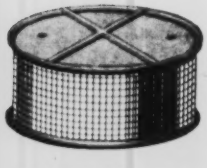
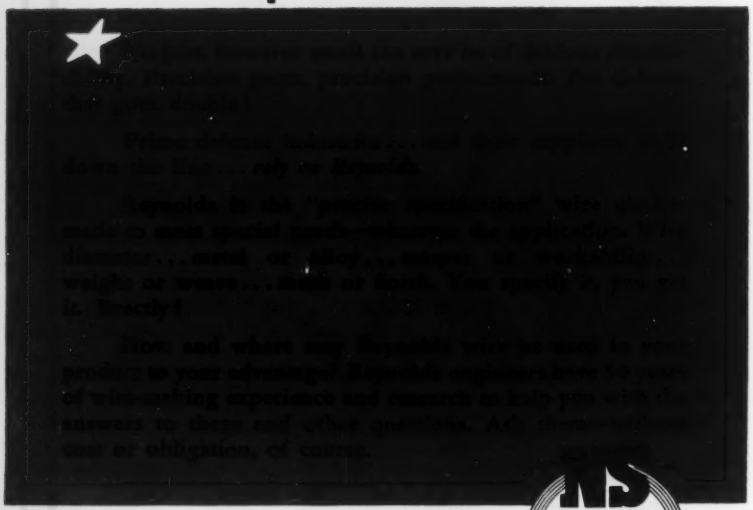


Small parts . . . but big in performance . . . air cleaners and brake linings are typical of many, many applications for which Reynolds wire is made to meet special needs of automotive and other "precise specification" industries.



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NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

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Early Bird

THE YOUNGER generation is getting into industry early these days. Not only that, it's leaving its mark.

Eight-year-old Flip Templeton waved everyone aside, took a spade in hand and turned the first shovel of earth for the new Broadview, Ill., plant of Templeton, Kenly & Co., Chicago. The company intends to use the plant for the manufacture of lever, screw and hydraulic jacks.

By the way, the coincidence of the name Templeton appearing twice is no coincidence. Flip is the son of J. B. Templeton, company president.

"open" foundation, with the floor, both immediately around the furnace as well as of the extended casthouse, carried on columns and beams. This arrangement, as compared with the older convention of retaining walls and fill, is essential to the crosswise casthouse layout.

Smooth Movement—It is becoming increasingly common practice to place the hot-blast stoves on yard-level foundations, with an elevated operating platform at approximately casthouse level. The advantage of convenience of movement between stove battery and furnace is had at the top as well as at the bottom, since it happens that the top platforms of both stoves and furnace thus arrive at about the same height above the yard. An above-ground breaching (under the stove operating platform) conveniently conducts the stack gases to the stove chimney.

Perhaps the only debit attaching to this arrangement is the deprivation of the use of the full combustion chamber height. Additional cross sectional area of combustion chamber may be required if adequate gas-burning capacity is to be established. This may call for larger stove diameter.

Current hearth and bosh construction is still conventional, with cast-iron hearth cooling staves attaining a length of 16 feet or more on large furnaces, and with the successive rows of horizontal copper cooling plates inserted in the banded bosh. This arrangement

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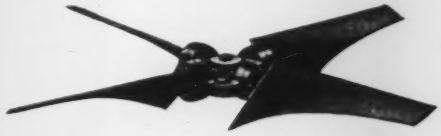

Aerodynamically designed for the rapid removal of air, the Burt Axial Flow Airfoil Fan is not "just another propeller". It provides a high volume of air delivery efficiently and economically.

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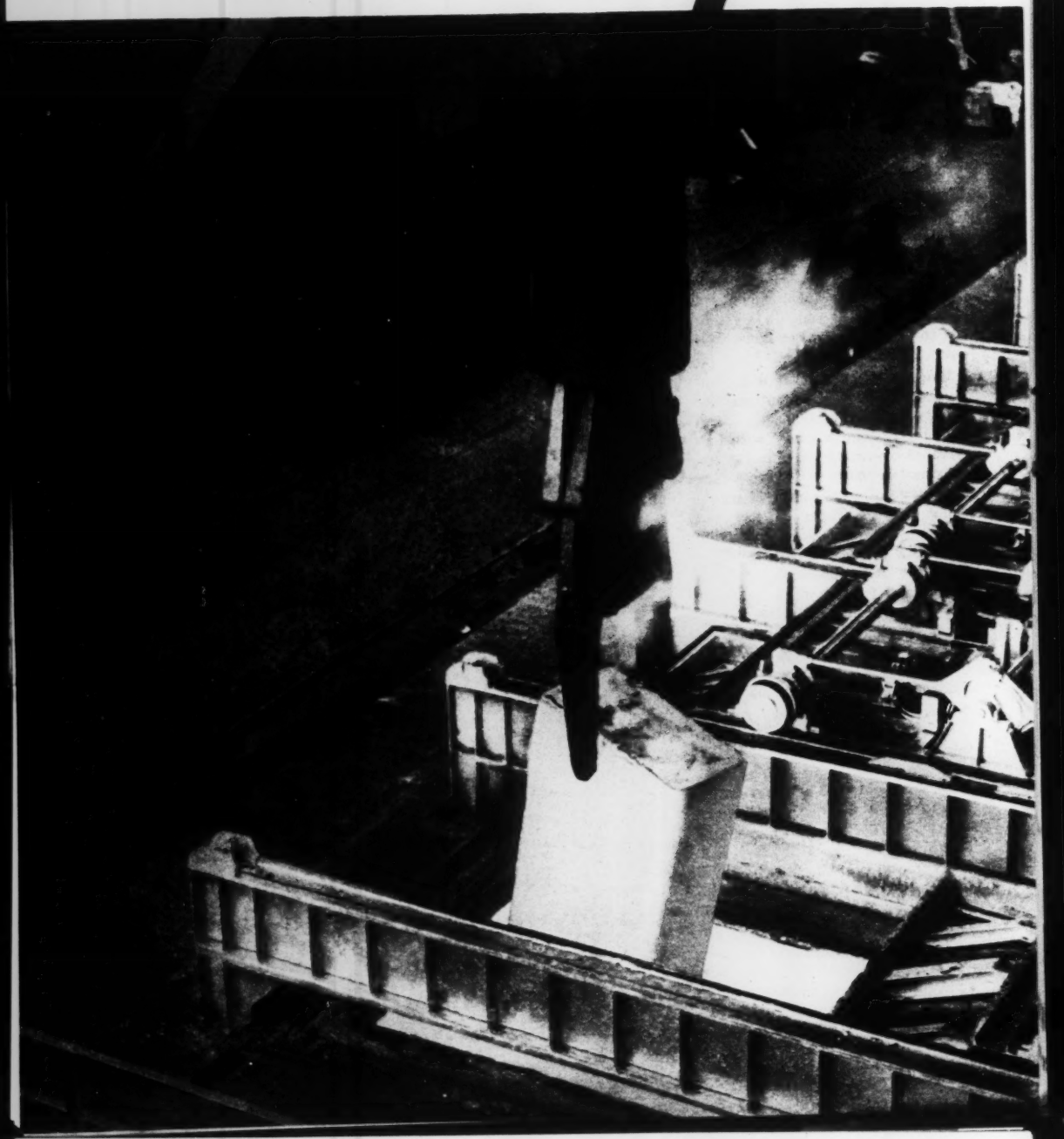

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The vast majority of soaking pits installed or under construction, in the current steel mill expansion program, have been supplied by Surface Combustion Corporation.

Such an overwhelming preference for 'Surface' pits is the result of proved pit dependability and such engineering advancements as the new venturi jet pump recuperative system.

● This highly efficient recuperative system combines a cold air fan, with a refractory recuperator for safe high temperature heat recovery, and a metallic recuperator for efficient recovery at lower temperature. The result is high air preheat under precise fuel-air ratio control and—faster production of uniformly heated ingots at low fuel rates.

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does not harmonize too well with carbon linings, and interest is shown in surface-cooling in these areas, with a solid bosh jacket replacing the banded construction. This would leave no cooling elements under hydraulic pressure except the tuyeres, tuyere coolers, and the slag notch rig.

Needs Study — The writer believes that there has been, all along, a chronically poor state of thermal conductance between cooling elements and the adjacent masonry they are supposed to preserve; that this situation has been particularly marked with respect to hearth-cooling staves, and that it would be equally marked with surface-cooled hearth and bosh. If this is true, and if carbon as well as brick work is the better for adaquate cooling, then some measures may be called for to improve this poor conductance situation between the metal jacket and the refractory wall.

Cast-iron furnace columns are almost no longer found in new construction, being prevailingly replaced by heavy rolled-steel sections, augmented with 2-inch thick flange plates.

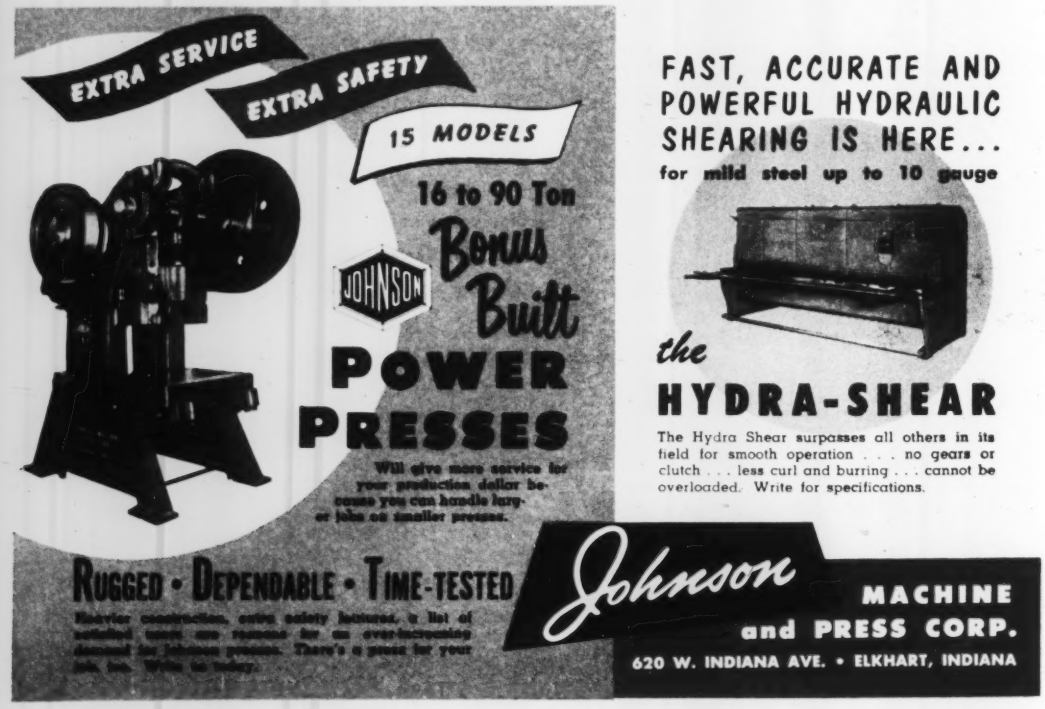
Mantels and shells are welded and in this connection R. K. Mathews, chief construction engineer, Freyn Engineering Department of Koppers Co. Inc. has this to say:

"The principal advantage of welding over riveting rests in lower shop fabrication costs and a savings in materials. The lower shop fabrication cost is due to a lesser amount of fitting-up in the shop and the elimination of the punching of rivet holes. The saving in material derives from the elimination of laps, butt-strap and double rivet heads.

"As to the cost and speed of field erection, there is a difference of opinion. We believe that the erection of a welded furnace shell is slightly lower in cost than riveted construction. There are certain erection advantages, however, that a riveted shell has over a welded job. A riveted structure can be easily assembled by placing a few fit-up bolts in the holes punched for riveting. Several horizontal plate rings can be fitted up and held in place with a few bolts before riveting is begun, if desired. A welded shell requires special fit-up holes and lugs for field assembly.

"A welded structure is stronger than a riveted shell. Design specifications allow that the strength of a good weld may be considered to be 85 per cent of the strength of the plate itself while the maximum allowance for a riveted connection is only 70 per cent of the plate strength."

Modern Equipment—More than 130 blast furnaces of the U. S. A. are equipped with automatic charging control. There are over 50 modern air-cylinder bell hoists; 30 dual-motor skip hoists. With a total of more than 300 automatic stockline recorders, it is obvious that almost every blast furnace has one. Many have two. There are perhaps 800 hot-blast stoves at U. S. blast furnaces. At least 160 stoves are equipped with suspended-element chimney valves; 280 with gate-type hot-blast valves; 320 with modern large capacity, automatically regulated pressure burners. Most of the latter are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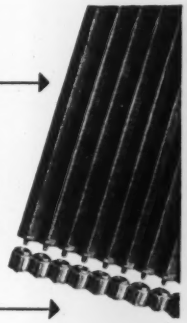
IMPROVED POSITIVE PLATE CONSTRUCTION. The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which make them highly corrosion-resistant.



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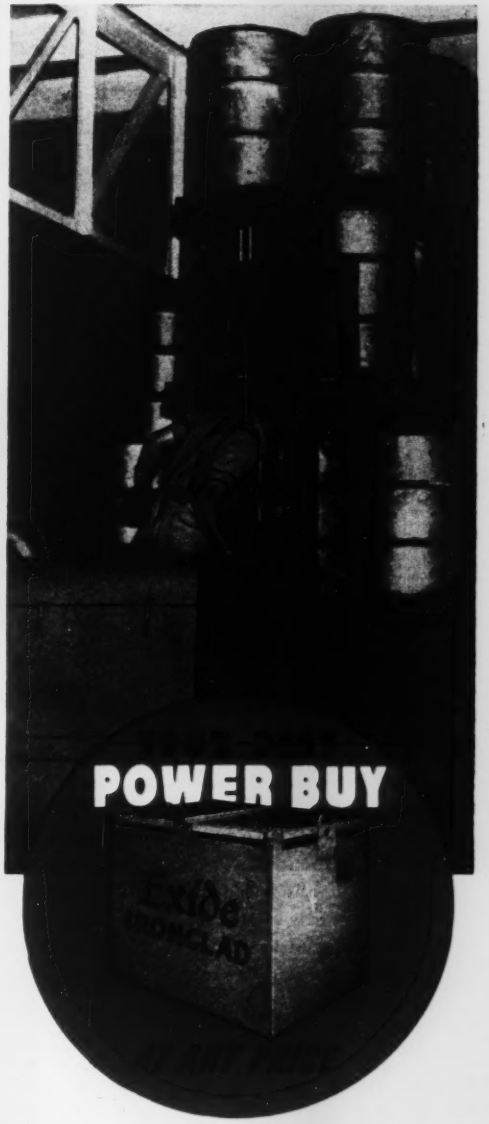

Why U. S. Rubber grinding wheels are the choice of steel foundrymen!

Small photo at top shows worker grinding large "T" used in refineries. Large photo shows worker smoothing casting of elbow.

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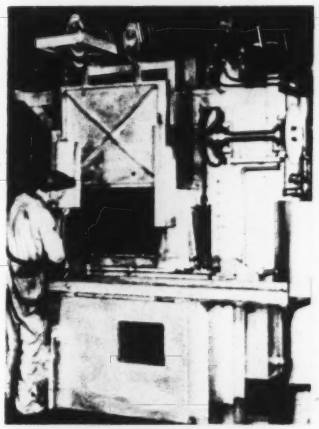


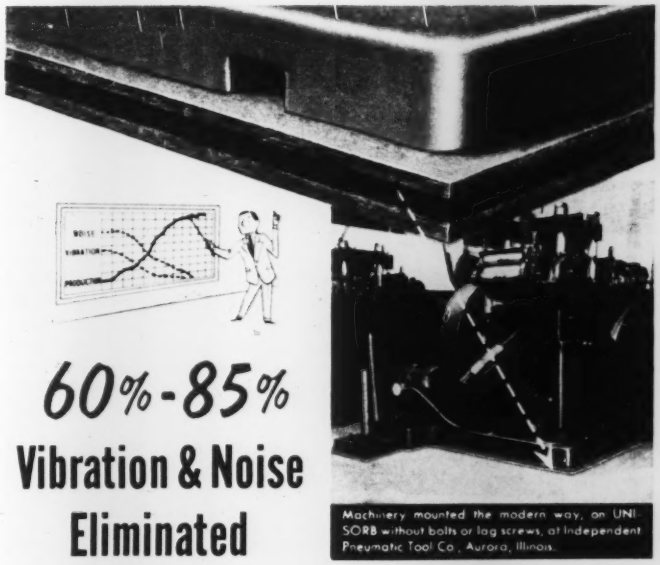
Versatile Heat Treater

Batch-type furnace, capable of case and homogeneous carburizing, dry cyaniding, clean hardening and carbon restoration is introduced by Surface Combustion Corp., Toledo, O. Available in 500 and 1600 pound-per-hour gross capacities, the unit's operating temperature range reaches 1450-1750°F using radiant tube elements equipped with automatic excess air provision responsive to the temperatures of the topmost checkers, a measure which has proved to be a boon in preserving brickwork against the ravages of alkali penetration.

Most of the dual-motor hoists associated with the smaller or medium size blast furnaces employ a combination of series-parallel and motor-field control. Most of the large new blast furnaces employ a combination of adjustable-voltage and motor-field control. Many of these latter are arranged to provide for series-parallel operation alternatively in the event that the motor-generator set becomes inoperative.

All but one of 16 new and recently rebuilt blast furnaces utilize pneumatic bell hoists. In the case of the one exception, it was decided to duplicate an electric bell hoist on an identical companion furnace in order to avoid time-consuming engineering alterations.

The favored system of handling breeze from the coke screens in the furnace stockhouse involves two skip-type hoists, one for each screen. This system provides a



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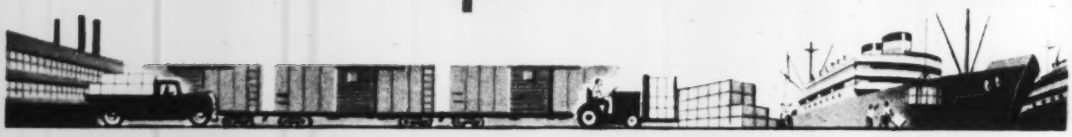

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Then the springs are fastened to the bottom of the shipping crate . . .

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Then the entire unit is crated. Springs are the only cushioning used.

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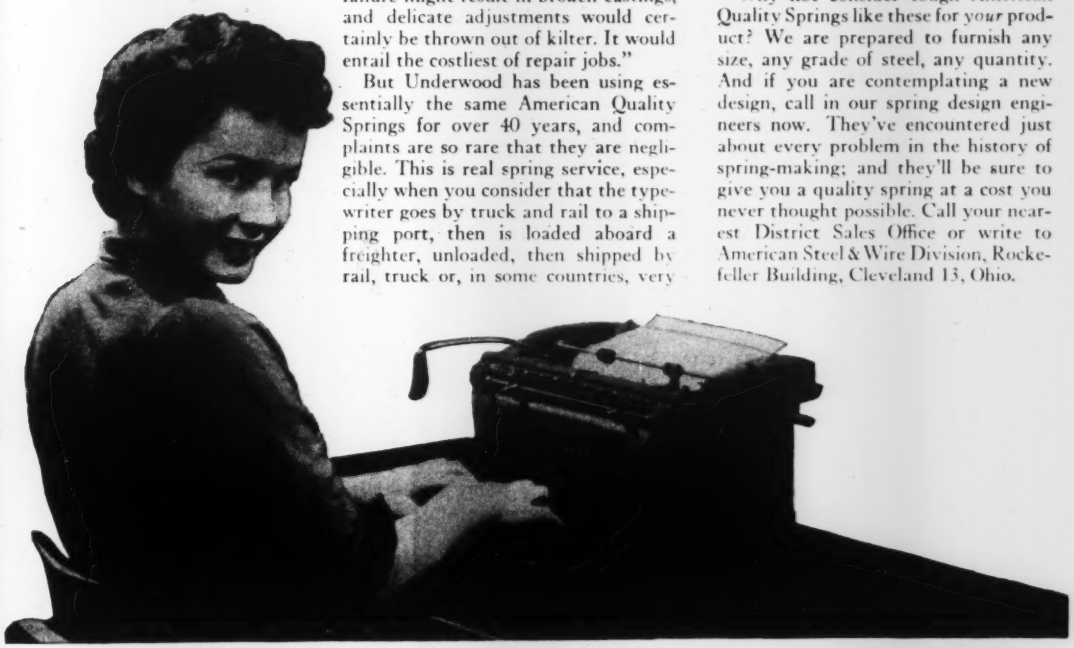
UNDERWOOD is so quality-conscious that they use a spring-cushioned packing crate for every typewriter shipped out of the country.

"These cushion springs have to be good," says Underwood, "because we use no other protective cushioning. Spring failure might result in broken castings, and delicate adjustments would certainly be thrown out of kilter. It would entail the costliest of repair jobs."

But Underwood has been using essentially the same American Quality Springs for over 40 years, and complaints are so rare that they are negligible. This is real spring service, especially when you consider that the typewriter goes by truck and rail to a shipping port, then is loaded aboard a freighter, unloaded, then shipped by rail, truck or, in some countries, very frequently *donkey cart* to some interior town.

As Underwood puts it, "The cushion springs must absorb unbelievably rough handling, jostling and drops. But we have a good reputation for damage-free arrivals."

Why not consider tough American Quality Springs like these for *your* product? We are prepared to furnish any size, any grade of steel, any quantity. And if you are contemplating a new design, call in our spring design engineers now. They've encountered just about every problem in the history of spring-making; and they'll be sure to give you a quality spring at a cost you never thought possible. Call your nearest District Sales Office or write to American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.



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measure of spare facility, and it occupies considerably less space than a conveyor-belt arrangement; however, there are several installations of the latter arrangement in use.

Gaining Favor—Equalizer and relief control equipment is coming more and more into use. This is the facility that brings top-gas pressure into the main hopper above the large bell prior to the lowering of the bell. It is indispensable on high-pressure furnaces, but there are almost twice as many installations on normal-pressure furnaces. The system is of great value not only in preventing hesitation or failure of the bell in opening, but also in avoiding the up-rush of gas into the hopper, so disturbing to the orderly movement of stock from the bell, and therefore so disrupting of good distribution.

Lessons of experience canalized to and correlated in centers of equipment development stand in marked contrast with what unfortunately are all too often examples of uncohesive individual extemporizings.

Vibrating screens have virtually become standard, there being scarcely any other type used at U. S. blast furnaces. Modern hot blast stoves are represented by the Freyn, McKee and Mohr types, all of which employ cluster tiles with 2-inch openings. Circular combustion chambers are giving place to the almost general adoption of those with elliptical contour.

Awakened Interest — Invariably new furnaces and many older ones, employ three stoves. There has been an awakening to the need for combustion chambers of ample horizontal areas. Many of them are more than 50 square feet. This provides sufficient gas-burning capacity to sustain a reasonable degree of blast temperature—characteristically about 1100° F—even if one of the three stoves is out of service. There is also to be seen in this use of large combustion chambers a recognition of the detraction from gas-consuming capacity imposed by placing the burners on an operating platform part way up the combustion chamber height.

The so-called Lake ore blast furnaces, with their 975° F average blast temperature demand, do not represent particularly good proving-ground for stove capacity. On the other hand, such hot-blast practice presents an opportunity for severe stove abuse by over-

High-Powered Mite

POCKET DEVICE has a ten-power magnifier and it's self illuminating. Bausch & Lomb Optical Co., Rochester, N. Y., manufacturer, says the magnifier is designed for on-the-job inspection of small parts, castings, small joints and welds, reading micrometer and other fine scales, and similar shop and laboratory uses.

It weighs only two and one-half ounces, including the two penlight batteries.

Lens construction allows the light from the bulb to go directly through the lens and onto the object, without any direct light reaching the user's eye.

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TYGON's elasticity permits thermal contraction and expansion without rupture.

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TYGON's high electrical resistivity prevents current losses in electrolytic action.

TYGON's smooth, non-porous surface makes for easier cleaning and greater solution flow.

TYGON's thermoplasticity permits the "heat-sealing" of seams to form continuous, one-piece, impermeable linings.

TYGON's selective solvent sensitivity eliminates the "need" for curing to obtain a strong bond—makes possible installations of virtually any size—simplifies field repairs.

TYGON's non-oxidizing characteristics give it a long service life.

Write, right now, for more information! Ask for our new 12-page booklet on TYGON LININGS — Bulletin TL-526. It's packed with facts and figures.

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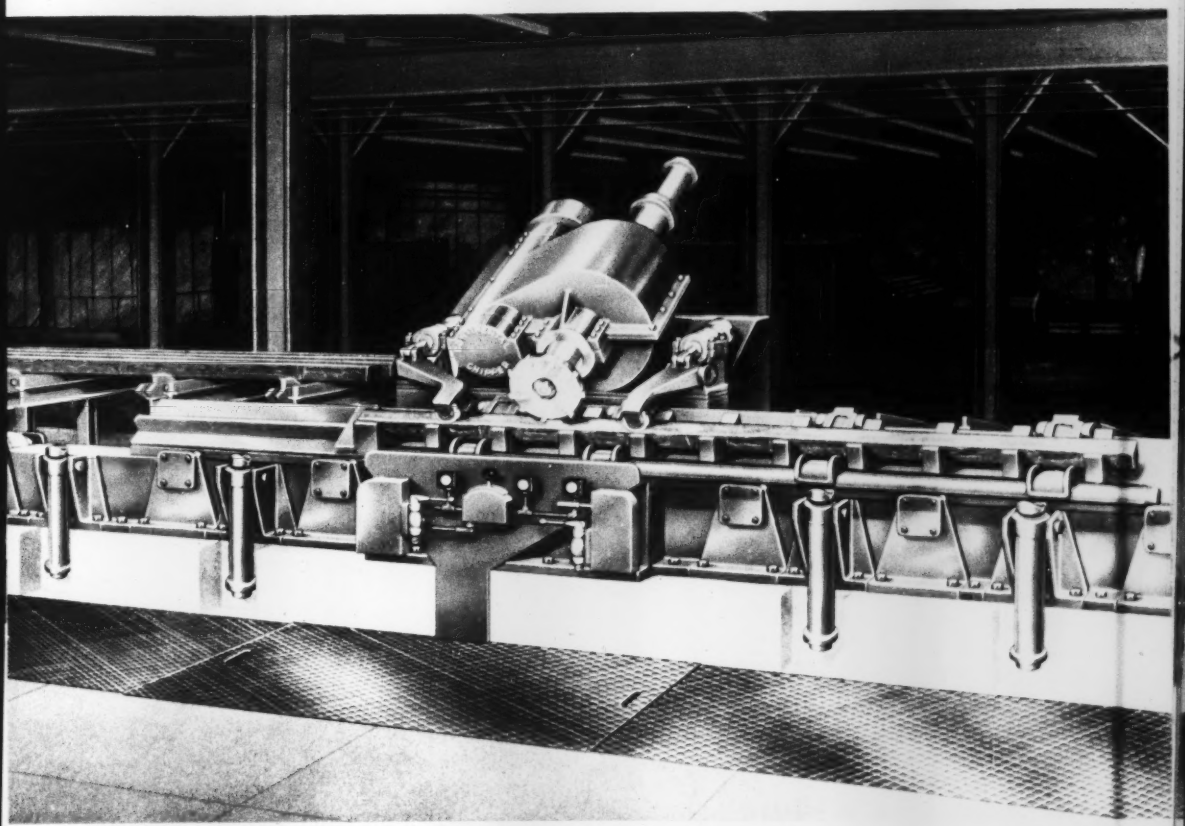

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heating; firing the stoves as though a call for 1500° were imminent, and continuing this firing of the on-gas stoves during interminable blast periods of the on-blast unit. In most cases, fortunately, but not in all, this contingency is forestalled by attention to stack-gas-temperature measurement, and the enforcement of a schedule of "bottling up" the hot stove when a prescribed stack-gas temperature is reached.

Primary gas-cleaning is accomplished in a variety of static washers and auxiliaries. Fine, or secondary cleaning equipment is divided between Cottrell tubular and Koppers plate-type electrical precipitators, and Freyn rotary disintegrators. The last-named equipment is the only form applied successfully in fine cleaning ferromanganese gas. Final cleaning is frequently directed to a dust content of less than 0.01-grain per cubic foot, especially where coke-oven underfiring with blast furnace gas is involved.

Room for Improvement—The U. S. furnaceman is sharply attuned to modern, labor-relieving and accuracy-promoting equipment. In two points he seems to be lagging. He is slow to adopt mechanical bin gates, and he still appears content to struggle with the massive, cumbersome, insecure and dangerous stove gas-port door. One looks to Britain to bring enlightenment with the closed-cab scale car equipped with bin-gate operating mechanism, and to point to the many excellent installations of gas-port gate-type valves.

From a paper presented at the 1951 general meeting of the Iron and Steel Institute, London.

New Press Breaks Billets

Horizontal column-type hydraulic press for breaking steel billets used in producing medium and large artillery shells has been installed in the plant of one of America's largest steel fabricators. Exerting a total pressing force of 1500 tons, the press splits blooms ranging from 5 to 20 feet long into billets measuring 5 to 24 inches in length. Builder is Lake Erie Engineering Corp., Buffalo.

Interesting feature of this press is the large tension columns, preshrunk to 50 per cent overload to prevent stretching and subsequent shock when the billet breaks. Breaking is accomplished by a large anvil mounted on the moving platen.

This anvil is driven toward the resistance platen on which are mounted two other anvils spaced equidistant from the moving anvil.

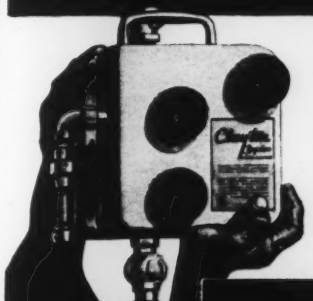
Tubing Solves a Problem

A recent and unique application for preshaped stainless steel tubing answers the need of dental instrument makers for a more suitable, easier-to-fabricate vise on matrix retainers. Supplier of the tubing is Superior Tube Co., Norristown, Pa.

Sheet steel used to be bent, seamed, soldered, blanked, burred, then heat treated and hand polished. The new seamless, preshaped tubing is reported stronger, easier to fabricate and is more sanitary. All the customer does is cut the tubing to size, drill for thumb-screw setting, and assemble into the finished matrix.

CLEAN BETTER, FASTER

hydro



Quickly and easily connected to any ¾", 60 p.s.i. steam outlet, the portable Clayton Hydro Steam Cleaner provides a heavy-duty cleaning and sterilizing system. It employs steam to pick up, mix and deliver a driving spray of properly balanced cleaning or sterilizing solution at controlled pressures and temperatures. *Where it hits, it's clean.* The toughest cleaning job is completed more thoroughly in one quarter the time required by obsolete hand cleaning methods. Mail the coupon for a FREE, convincing demonstration in your own plant.

REDUCE OVERHAUL DOWN-TIME
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SPEED UP SEASONAL CLEAN-UP
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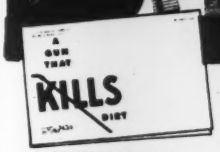
CLEAN FLOORS WALLS AND WINDOWS



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Dual-Feed Protector

New spray gun mixes paint, catalyst to a 10 mil buildup in one application

SPRAY PAINTING gun developed by Binks Mfg. Co., Chicago, is effective for applying the recently-developed epon resin paints. To make the application succeed, a catalyst is mixed with the paint as the gun is fired, but a split second before the paint strikes the surface.

Blending paint and catalyst is accomplished with a dual feed head on the gun. Because of the rapidity with which the paint sets up after catalyst is added, the two must be blended after they leave the gun. Correct balance achieved between catalyst and paint is of utmost importance.

Precision System—The gun is essentially a heavy-duty production tool with the precision catalyst feeding system added. Exterior location of the catalyst nozzles permits the operator to observe flow of the catalyst.

Hook-up for the catalyst painting system consists of the gun, an air line, and line for paint and catalyst; two pressure tanks (one for paint, one for catalyst); and gages and fittings. To assure correct feed ratio of catalyst to paint, the same air pressure is used on both tanks. All fittings in the system have standard pipe threads to speed hook-up and transfer of equipment.

One Coat—The paint, a product of Glidden Co., is called Nu-Pon-A. Results show excellent resistance of exterior steel structures to attacks by chemicals, corrosion and moisture. One finish coat leaves an extremely thick yet flexible, hard and abrasion resistant film.

Resin base for the finish is a development of Shell Oil Co. Addition of the catalyst permits a polymerization to take place at normal air-drying temperatures, making the product adaptable to field maintenance.

Quick-setting feature allows a single coat to be built up to a thickness of more than 10 mils without running or sagging. This means a job of protecting exterior metal surfaces can be done with a single finish coat, instead of four or five. Manhours for application are reduced sharply and need for repeated scaffolding is eliminated.

Taped Templates Pay Off

Labor savings on drilling and template making, and dollar savings of $50 to $100 a day are the results of a new technique for protecting templates during drilling, developed by Ross Heater, division of Kewanee-Ross Corp., Buffalo.

To effect this saving, the firm applies a solid covering of 6-inch-wide strips of masking tape across the multi-holed top surface of each template. The template is then rubbed with a colored crayon to outline the holes underneath.

Chips Brushed Away — While holes are bored in the steel plate below the template, the resulting chips and slivers collect on the taped surface and have only to be brushed away before the next hole is drilled.

Formerly, such chips and slivers would spray up and fall into the

template's other unprotected holes. To prevent out-of-round holes or other serious damage to the template, the steel particles had to be painstakingly removed with a magnet and pick before any further drilling could be accomplished.

Elimination of delays and a 300 per cent improvement in template life account for the firm's present savings.

Mule to Firefighter

Fire protection in even the most remote section of the factory is the purpose of a unique fire truck designed by plant protection officials of the Chevrolet division of General Motors, Baltimore.

Starting off with a standard C7-21 Clarktor mule tractor they equipped it with an Ansul S-150 dry chemical fire extinguisher behind the driver's seat and two Ansul 20-B hand extinguishers on each front fender. Completing the equipment is a 20-foot extension ladder, an MSA breathing apparatus, rubber boots, rope, fire axes, siren, headlights, searchlight, etc. It is powerful, maneuverable and small enough to negotiate narrow factory aisles.

Enough for Runways

ANYBODY WANT a mile or so of workbenches? That's the way Standard Pressed Steel Co., Jenkintown, Pa., is selling them.

The company has an Air Force order from Wright Field, Ohio, for two and a quarter miles of benches—2000 of them.

Benches are all steel, measure 6 feet long by 30 inches wide, and weigh 275 pounds each.

Sulphur Removed from Gases

A recovery unit built especially to recover sulphur from waste gases formed in manufacturing carbon disulphide was recently placed in operation by J. T. Baker Chemical Co. at its Taylor Chemical Division, Penn Yan, N. Y. All of the recovered sulphur is reused in making carbon disulphide.

Air under pressure and waste hydrogen sulphide gases are burned in a boiler and passed over a catalyst bed where they are converted into a hot, gaseous combination of sulphur and water. This combination goes through a scrubber tower where molten sulphur, introduced from the opposite end, cools and absorbs the gaseous sulphur.

This plant was one of the first to produce carbon disulphide in commercial quantities by a unique electrothermal process — one in which molten sulphur and lump charcoal are reacted within a huge electric furnace.

Tips on Broadening Skills

How to broaden the skills of the nation's work force is the subject of a new 16-page, illustrated booklet published by Bureau of Apprenticeship, U. S. Department of Labor, Washington.

Titled "Your Skill Improvement Program," the booklet emphasizes importance of developing training programs to meet specific needs, sets forth ideas and suggestions for the organizing and operating skill improvement programs. It also provides a check list that en-

Operators of shovels . . . draglines . . . cranes . . . rail cars . . . lift trucks . . . road machinery . . . tractors . . . mining machinery . . . logging equipment . . . oil well rigs are discovering the advantages of **TORCON TORQUE CONVERTERS.** This automatic hydraulic transmission features variable speed and torque ratios, and facilitates the full utilization of your power source throughout the entire range of operation.

TORCON CONVERTERS are available for applications involving horsepowers from 30 to 600. They can be furnished with and without cut-off clutches.

TORCON units assure *maximum utilization of horsepower,* provide for *more production at less cost, eliminate shock to powered equipment, reduce operator fatigue* and *increase* the *service life* of your machinery.

Write today for complete engineering details.

CONVERTER

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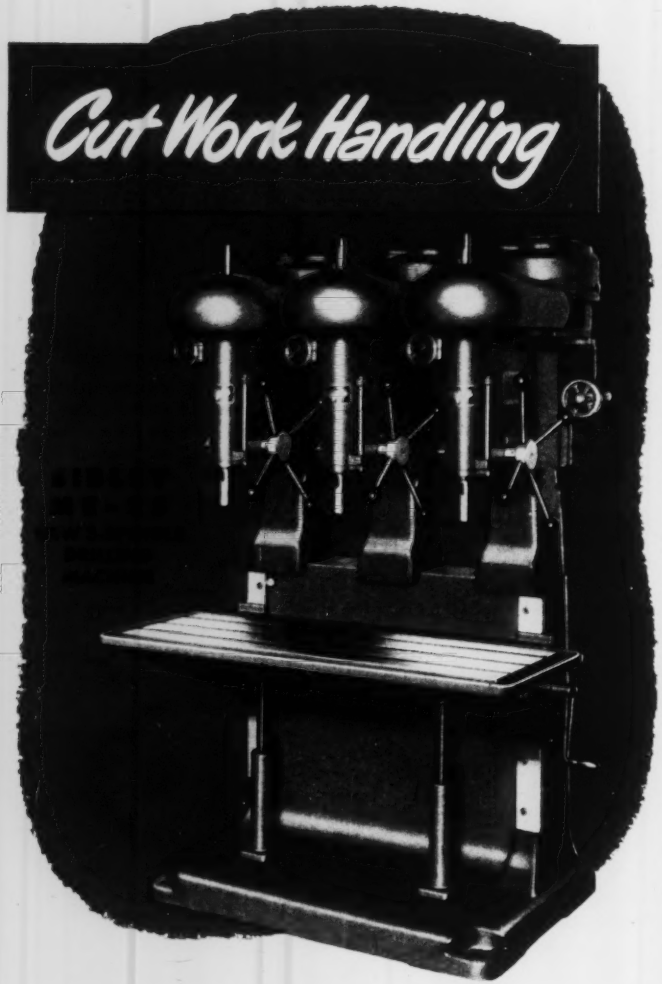
1188 FIFTH STREET
ASHTABULA, OHIO

USE MORE OF YOUR HORSEPOWER MORE OF THE TIME

636-TC

Cut Work Handling



Work-handling consumes more time than work-cutting in producing many jobs. Reducing manual effort by one-half may increase production more than by faster cutting speeds. To make this improvement without burdening the operator —in fact to make it easier for him—is the chief advantage of the new Sibley Model ME-25.

The variable speed drive, the big 21½" swing, the extra large table, the convenient speed controls, the handy tachometers, all combine to make this 1" capacity, medium weight machine a production advantage in any shop!

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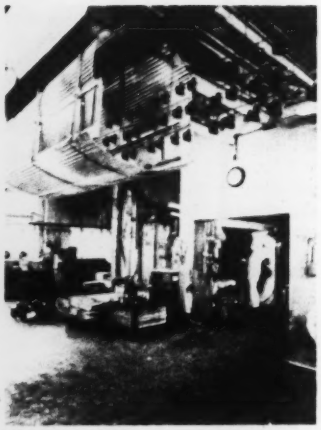


22,000 Parts per Shift

New far-infrared oven at Foxboro Co., Foxboro, Mass., makers of industrial process instruments, bakes paint on 22,000 meter parts in an 8-hour shift. The oven, a product of Edwin L. Wiegand Co., Pittsburgh, consists of four aluminum radiant heaters and reflective aluminum sheeting, located overhead. Conveyor speed is 4½ fpm

ables an employer to make a spot evaluation of his current training position.

Lincoln Awards $30,000

Announcement is made of the 1953 James F. Lincoln Arc Welding Foundation mechanical design award program. Awards totaling $30,000 will be given winners of this national competition among men engaged in the design or manufacture of machines or machine components.

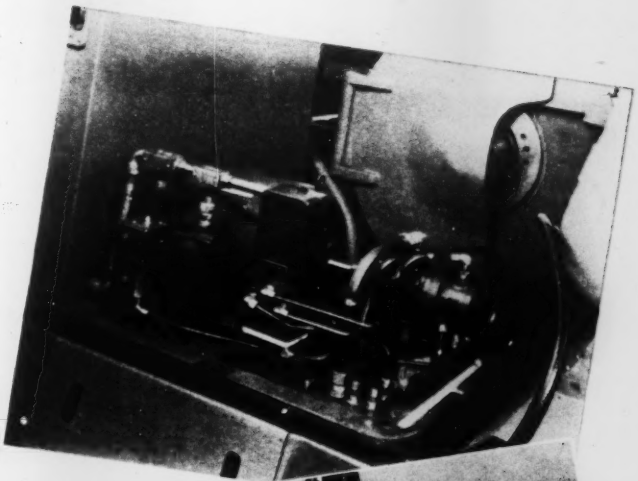
One purpose of the program is to stimulate development of the arc welding industry through advancements in applications for the process. Award details are available through the foundation, Cleveland 17.

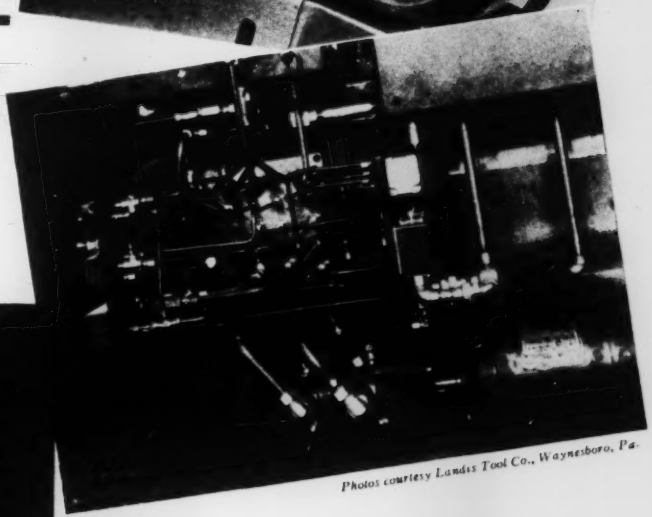
Speed Photo Men Meet

Engineers from Europe and America heard 41 technical papers during the International Symposium on High-Speed Photography held recently in Washington by Society of Motion Picture and Television Engineers.

Subjects included photographic instrumentation in guided missiles and other munitions research, x-ray recording, arc welding and combustion research.

CHECK ✓ THESE GOOD REASONS FOR USING SUMMERILL HYDRAULIC TUBING ✓





Photos courtesy Landis Tool Co., Waynesboro, Pa.

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Illustrated above are typical examples of the use of Summerill cold drawn seamless steel tubing in the hydraulic pump hook-up and control lines of modern machine tools.

In this field, as in many others where liquids must be conducted under high pressures reliably, the trend today is toward the use of steel hydraulic tubing exclusively. It is safer, stronger—won't break at stress points, bends, etc., yet handles and works easily and is simple to fabricate.

Summerill's new plant and progressive methods bring you hydraulic tubing at its best, in a full range of carbon steel sizes from $\frac{3}{16}$" to $1\frac{1}{2}$" O.D. ● Let us quote on your requirements. ***Summerill Tubing Company Division, Columbia Steel & Shafting Company, Pittsburgh 30, Pa.***

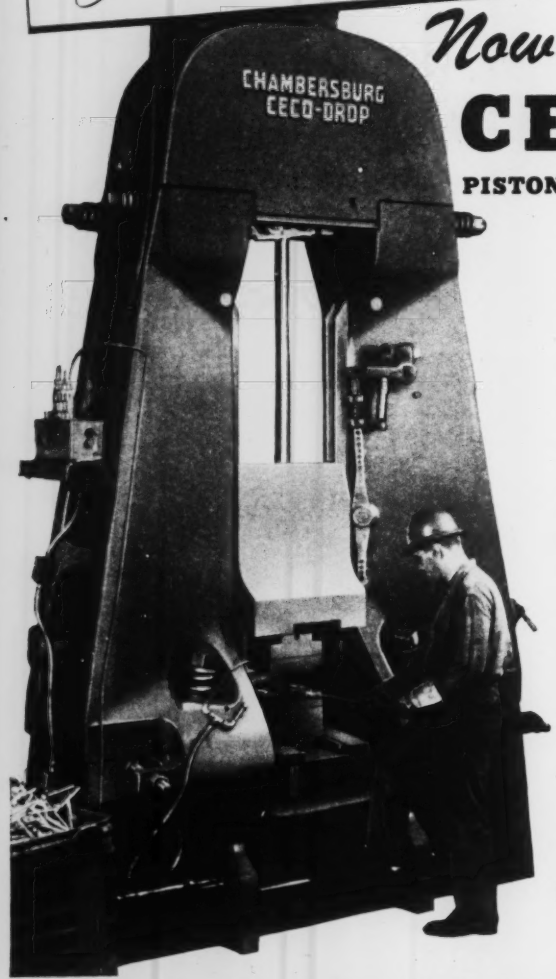
WAD 4473

IN COLD DRAWN SEAMLESS STEEL TUBING

SPECIFY *Summerill* AND BE *SURE!*

WITH COMPETITION GETTING KEENER—

Down Time becomes more costly!



Now is the time to ask about the

CECO-DROP

PISTON-LIFT, GRAVITY DROP HAMMERS

High labor costs, high material costs can only be offset by increased production per machine. If your board drop hammers are showing signs of use, more and more time and expense is necessary for board replacement, adjustments and repairs; don't wait—investigate CECO-DROP piston-lift, gravity drop hammers now. (Especially consider the fact that Ceco-Drop upper works can probably be installed on your present board drop hammer anvils.)

CECO-DROP HAMMERS are the result of more than a half century of experience in the manufacture and design of hammers. They cost less to operate. There are no board changes, no friction adjustments, and lubrication is automatic. Treadling the Ceco-Drop is easy and not fatiguing, and die alignment is held. The unique stroke adjustment and short stroke control afford a wide range of operation.

Write today for information about Ceco-Drop Hammers. Ask for Bulletin 11-L-0. You'll be glad you did.

CHAMBERSBURG ENGINEERING COMPANY, CHAMBERSBURG, PA.

CHAMBERSBURG

THE HAMMER BUILDERS

CALENDAR
OF MEETINGS

October 19-22, American Institute of Wholesale Plumbing & Heating Associations Inc.: National convention, Chalfonte-Haddon Hall, Atlantic City, N. J. Institute address: 402 Albee Bldg., Washington. Executive secretary: George T. Underwood.

October 20-22, Packaging Institute: Annual meeting, Hotel Commodore, New York. Institute address: 342 Madison Ave., New York 17. Secretary: L. V. Burton.

October 20-24, American Society for Metals: Annual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 20-24, American Welding Society: Annual meeting, Bellevue Stratford Hotel, Philadelphia. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 20-24, Society for Non-Destructive Testing Inc.: Annual meeting, Hotel Sylvania, Philadelphia. Society address: Box 710, Evanston, Ill. Secretary: Philip B. Johnson.

October 20-24, American Institute of Mining & Metallurgical Engineers: Fall technical session, Hotel Adelphia, Philadelphia. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

October 20-24, National Metal Congress & Exposition: Convention Hall, Philadelphia. Secretary: W. H. Eisenman, 7301 Euclid Ave., Cleveland 3.

October 20-24, National Safety Council: National safety congress & exposition, Conrad Hilton Hotel, Chicago. Council address: 425 N. Michigan Ave., Chicago 11.

October 22-24, Porcelain Enamel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: DuPont Circle Bldg., Washington 6. Secretary: John C. Oliver.

October 22-24, Society of Automotive Engineers: National transportation meeting, William Penn Hotel, Pittsburgh. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 23-24, Steel Products Warehouse Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 725 15th St. NW, Washington 5. Executive secretary: James L. Dougherty.

October 27-29, National Lubricating Grease Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute address: 4638 J. C. Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 27-28, American Gear Manufacturers Association: Fall meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

October 27-30, American Gas Association: Annual meeting and exposition, Municipal Auditorium, Atlantic City, N. J. Association address: 420 Lexington Ave., New York 17. Secretary & convention manager: Kurwin R. Boyes.

October 27-31, Electrochemical Society Inc.: Fall meeting, Mt. Royal Hotel, Montreal. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

October 28-29, Materials Handling Conference: Westinghouse Electric Corp., sponsor, Hotel Statler, Buffalo.

October 30-31, National Association of Aluminum Distributors: Annual convention, Del Monte Lodge, Pebble Beach, Calif.

October 30-November 2, National Tool & Die Manufacturers Association: Annual meeting, Hotel Sheraton, Rochester, N. Y. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

October 31, Blast Furnace & Coke Association, Chicago District and Eastern States Blast Furnace & Coke Oven Association: Joint meeting, Del Prado Hotel, Chicago. Meeting secretary: W. D. Miller, U. S. Steel Co., Chicago 17.

October 31-November 2, Automotive Parts Rebuilders Association: Annual meeting, Conrad

(Continued on p. 128)

for POROSITY-FREE QUALITY

Our scientific procedure of determining gating procedure, rate of flow, the size, shape and location of risers, etc., was developed to produce leak-proof pressure castings. But since it is standard operating procedure in our foundry, *every* casting we produce is porosity-free quality . . . and at no higher cost to you.

for SCIENTIFIC CASTING PRODUCTION . . . NO "CUT AND TRY"

Because each step of the casting procedure is determined scientifically *before* the pattern enters the foundry, "cut and try" has been completely eliminated. This assures you of predetermined quality and rate of production. It also means that production gets started long before normal and without annoying delays to your production schedules.

for LARGE VOLUME CAPACITY . . . COMPLETE FACILITIES

Here at Aluminum Alloys you find all the required facilities to turn out volume production of aluminum castings in any size from an ounce to 300 pounds. Over twenty years' experience casting aluminum exclusively is at your disposal to help solve a casting problem—to assume responsibility for your casting requirements from pattern through production.

- ***Chemical and Physical Laboratory Control***
- ***Heat Treat Facilities***
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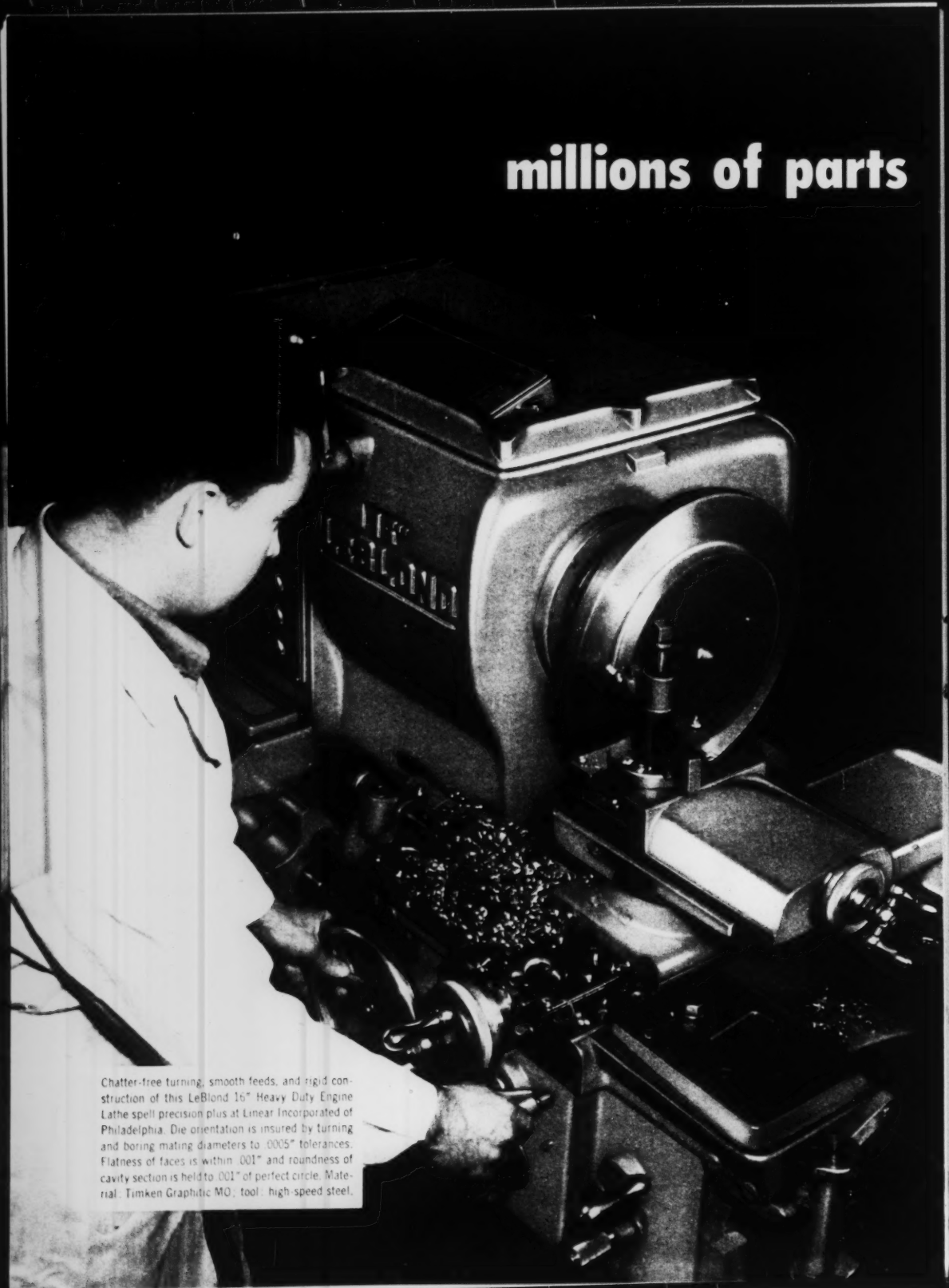
Your inquiry will receive immediate attention. Phone, wire or write to **Aluminum Alloys Corp., Warren at West Walton, Detroit 10, Mich. TYler 8-5300.**

ALUMINUM ALLOYS Corporation

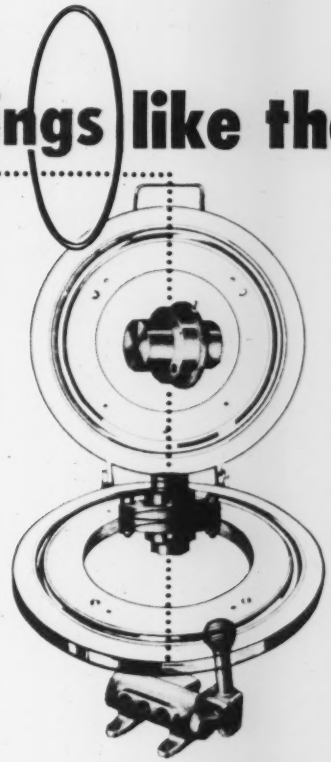
HOME OF RAY DAY PISTONS

millions of parts



Chatter-free turning, smooth feeds, and rigid construction of this LeBlond 16" Heavy Duty Engine Lathe spell precision plus at Linear Incorporated of Philadelphia. Die orientation is insured by turning and boring mating diameters to .0005" tolerances. Flatness of faces is within .001" and roundness of cavity section is held to .001" of perfect circle. Material: Timken Graphitic MO; tool: high-speed steel.

are married with rings like these



Industry needs sealing rings to "marry" millions of parts against leakage of air, liquid, and gas. Seals, for example, like the rubber "O" rings made by Linear Incorporated of Philadelphia. They're vital to the successful operation of hydraulic mechanisms, air-operated devices, and chemical processing equipment . . . to name just a few applications. And industry says, "Make these sealing rings to precision tolerance for non-leakage. Deliver the millions we need at low cost."

Linear experimented . . . found that "O" rings with the required finish and roundness could be mass-produced easily enough . . . but to turn them out at low cost demanded virtual elimination of hand-finishing operations. The problem called for dies made to tolerances that would deliver cross-sectional roundness conforming to nearly "perfect circle," mating diameters so accurate that perfect die orientation could be achieved.

Then Linear installed their new 16" LeBlond Heavy Duty Engine Lathe. This profit-building lathe is saving expensive toolroom time and delivering cavity finish on Linear's dies as fine as 10 microinches, mating diameters to the required .0005" whisker of tolerance, cross sectional roundness within .001" of perfect circle. Costly die-finishing time at Linear is down . . . flash-removing second operations on "O" rings are at a bone-bare profit-making minimum. It's a case of chatter-free turning, smooth-as-silk feeds, and rigid construction.

LeBlond features like hardened and ground self-compensating steel bed ways, totally enclosed quick-change box, one-piece apron and a host of others will insure Linear a lifetime of this same smooth-turning performance.

Whether you need unfaltering accuracy or high output rapid production, there's a LeBlond lathe that will fill the bill. Your nearby LeBlond distributor will tell you about our complete line. Call him or write

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

Ask for Bulletin HD125G
for more information on the 16"
LeBlond Heavy Duty Engine Lathe

turned faster by

LeBLOND
of Cincinnati

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 64 YEARS*

SPECS FOR NON-FERROUS FINISHING GOT YOU DOWN?

FIND OUT ABOUT **IRIDITE** TODAY for finishing ZINC, CADMIUM, ALUMINUM, CUPROUS METALS

WANT CORROSION RESISTANCE? Iridite will give you better-than-specification protection against corrosion.

WANT PAINT ADHERENCE? Iridite provides a firm and lasting base for paint by preventing under-film corrosion.

WANT EYE-APPEAL? Iridite can give you a variety of finishes, depending upon the metal being finished . . . from clear and sparkling bright or military olive drab, to attractive dyed colors.

BEST OF ALL, any Iridite finish is economical and easy to apply.

for example: **IRIDITE** (AL-COAT) REDUCES NEED FOR ANODIZING

Simple chemical dip; immersion time only 10 seconds to 2 minutes; no sealing dip; color is clear or yellow depending upon your requirements; salt spray resistance equivalent to 20 to 30 minutes of anodizing, eliminates need for costly racks and electrical power.

Write for Circular describing Iridite and Al-Coat, and send your production samples for free test processing. Each coating is "tailor" to your specified requirements. Also ask for information about Iridite Chromatizing and Iridite Phosphating processes.

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(Continued from p. 125)

Hilton Hotel, Chicago. Association address: 220 S. State St., Chicago 4. Secretary: Jack O'Sullivan.

November 3-4, Society of Automotive Engineers: National diesel meeting, Hotel Chase, St. Louis. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 5-7, Industrial Management Society: Annual time and motion study, and management clinic, Hotel Sheraton, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 5-9, Scientific Apparatus Makers Association: Mid-year meeting, industrial instrument, laboratory equipment, optical, aeronautical and military instrument sections, The Homestead, Hot Springs, Va. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 6-7, Society of Automotive Engineers: National fuels and lubricants meeting, The Mayo, Tulsa, Okla. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 8, American Society of Tool Engineers, Chicago Chapter: Annual midwestern tool engineering conference, Urbana, Ill. Conference arrangements: Prof. L. E. Doyle, University of Illinois.

November 8-9, Open Steel Flooring Institute Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 2311 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

November 9-11, Grinding Wheel Institute: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit, Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting, Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-13, American Petroleum Institute: Annual meeting, Conrad Hilton Hotel and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20.

November 10-14, National Electrical Manufacturers Association: Annual meeting, Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting, Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 19, American Standards Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey Jr.

November 19-20, Industrial Hygiene Foundation: Annual meeting and conference, Foundation address: Mellon Institute, Pittsburgh 13. Managing director: C. Richard Walmer, M. D.

November 20-21, American Society for Personnel Administration: Fall meeting & exhibit, Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

November 20-21, American Society for Quality Control: Midwest quality control conference, Hotel Claypool, Indianapolis. Conference information: Dale A. Cue, Indianapolis Section, ASQC, Box 5664, Indianapolis.

November 20-22, Galvanizers Committee, American Zinc Institute: Fall meeting, Hotel Bismarck, Chicago. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Gent.

November 21, Association of American Railroads: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 30-December 5, American Society of Mechanical Engineers: Annual meeting, Statler and McAlpin Hotels, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

An Open Letter of Thanks to V.I.P.*

H. D. PAXSON, PRESIDENT
THEDA L. PAXSON SEC.-TREAS.

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PAXSON MACHINE COMPANY

Engineers and Builders of
COLD-ROLLED STRIP-MILL EQUIPMENT
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Coast to Coast
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Dear Customers:

Thanks to you VERY IMPORTANT PEOPLE for giving us the users' point of view in developing Paxson Slitting Equipment.

You, the actual users, are the ones who really engineered and designed Paxson Slitting Lines.

The combined knowledge, ideas and suggestions of slitting men in plants large and small have guided us in developing custom built lines that best meet your specific needs.

For the utmost in modern efficiency and economical operations, users rely on us for both general and heavy duty lines.

Now, more than ever, it truly can be said:
"PAXSON GIVES YOU THE EDGE".

Appreciatively yours,

PAXSON MACHINE COMPANY

H. D. Paxson, President

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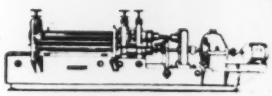
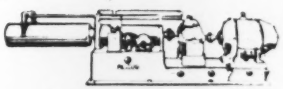
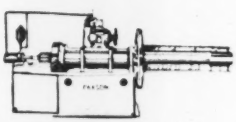


SLITTERS



COILERS



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2800 ft. E.W. runway and club house, private field 2 miles west of Salem, maintained for your convenience. Wire or phone arrival time. We will meet your plane.

6

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Engineers and Builders of Cold-Rolled Strip-Mill Equipment SPECIALIZING IN SLITTING LINES

REMEMBER, ALL PAXSON LINES ARE CUSTOM BUILT

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

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The World's Largest Job Galvanizing Plant
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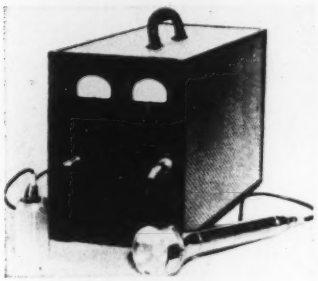
galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment

Portable Dynamic Balancer

. . . tracks down vibration source

Electronic machine measures accurately and without computation the amplitude and frequency of vibration, discovering its source by a stroboscopic light. The unit consists essentially of a vibration pickup, a multichannel electronic



circuit and the stroboscopic lamp. It operates on 110 v, 60-cycle current.

For maintenance, the machine can be used to discover and correct unbalance in manufacturing equipment. In production, it can be integrated with a test stand for dynamic balancing of rotating parts in the range from 600 to 40,000 rpm. International Research & Development Corp., Dept. ST, 908 W. Third Ave., Columbus 8, O.

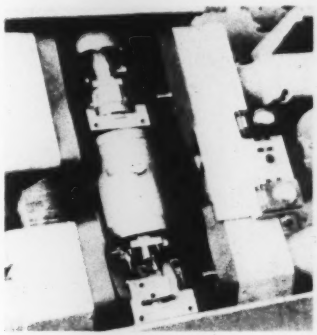
USE REPLY CARD—CIRCLE No. 1

Automatic Boring Unit

. . . machines wrist pin holes

Semifinishing bores, finish grooving and chamfering can be done by the model 355 Bore-Matic at the rate of 700 parts per hour. Machine consists basically of four special hydraulic cross slides mounted on a fabricated base, with a two-station hydraulically operated fixture positioned between the slides. A boringhead and related drive equipment is mounted on each slide. The 40-degree angle of the slides to the base provides ease and speed of loading and operation.

Boringheads run continuously and coolant for each station shuts off automatically as cross slides reach the rest position. Part is clamped hydraulically using the



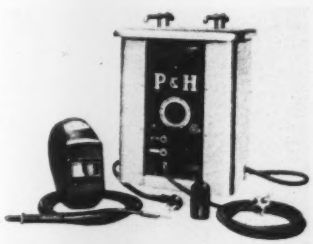
outside diameter, dome end and outside diameter of rough wrist pin bosses on the inside of the piston. Heald Machine Co., Dept. ST, Worcester 6, Mass.

USE REPLY CARD—CIRCLE No. 2

Small Shop Welder

. . . range reaches 20 to 180 amps

Limited input-type welder is built to provide small shops an economical means for doing their own welding. This model has high open circuit voltage of 65 v, a welding range 20 to 180 amps. Its Dial-Lectric controls provide continu-



ous heat control from minimum to maximum capacity. Machine has a high range for general purpose welding and low range for light-gage operation. The unit uses about 1 kwh. Harnischfeger Corp., Dept. ST, 4400 W. National Ave., Milwaukee 14, Wis.

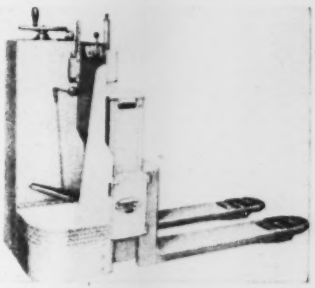
USE REPLY CARD—CIRCLE No. 3

Electric Pallet Truck

. . . has three-point suspension

Full use of factory and warehouse space should be possible with a riding-type electric-powered pallet truck that can maneuver in 6½-foot wide aisles with a 40 x 48-inch pallet. This Transveyor model handles 4000-pound maximum loads.

The four-wheeled truck has three-point suspension, providing



balanced action, equalizing the load on both front wheels regardless of floor conditions. Truck is 29 inches long, moves at 4 mph loaded. Automatic Transportation Co., Dept. ST, 149 W. 87th St., Chicago 20, Ill.

USE REPLY CARD—CIRCLE No. 4

Heavy Duty Live Centers

. . . eliminate vibration

Maximum point runout of 0.0002-inch is claimed for these heavy duty live centers. They have a maximum rating of 6400 pounds at 100 rpm, or 3200 pounds thrust load. Preloaded rigidity and bearing wear are controlled by an adjustable retainer ring. A heavy duty grease seal retains the lubricant and prevents entrance of cut-

REPLY CARDS

on page 143 will bring you more information on any new products and equipment in this section.

SAVE 2 WAYS with UNBRAKO SOCKET HEAD CAP SCREWS

1 TAP FEWER HOLES

It costs money to tap holes. You have to lay out, center punch, center drill, tap drill, body drill, counterbore, tap the hole, and insert the screw. The fewer holes you tap, the less the cost. *Three* UNBRAKO *screws will do the same job as five ordinary cap screws.*

2 USE SMALLER DIAMETER FASTENERS

Since a $\frac{3}{8}$" UNBRAKO Socket Head Cap Screw is as strong as an ordinary carbon steel screw of $\frac{1}{2}$" diameter, you save in weight and cost by using UNBRAKO. And because smaller diameter screws require less space, they permit more compact designs.

When designing, it pays to save with UNBRAKO! Write for descriptive literature. STANDARD PRESSED STEEL Co., Jenkintown 33, Pennsylvania.

UNBRAKO® SOCKET SCREW DIVISION

SPS

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CAP SCREWS • SET SCREWS • SHOULDER SCREWS • DOWEL PINS • PRESSURE PLUGS

ting oil, metal chips, etc. Sizes include No. 5 and No. 6 Morse tapers. Holub Industries Inc., Dept. ST, Sycamore, Ill.

USE REPLY CARD—CIRCLE No. 5

Water-Cooled Welding Torch

. . . without outside plumbing

Rated capacity for continuous duty at 300 amp is cited for a water-cooled Heliarc welding torch. Either high-frequency stabilized alternating current or straight polarity direct current can be used. Torch welds almost all commercial metals up to approximately $\frac{1}{8}$-inch thick. Cooling water flows directly into the torch body—there is no outside plumbing.

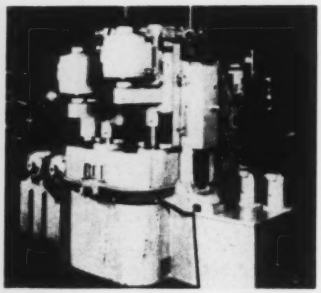
Because the electrode holder has direct water cooling, the collet body is brought closer to the arc without damage from excess heat. This should mean reduced electrode stub loss. Linde Air Products Co., division of Union Carbide & Carbon Corp., Dept. ST, 30 E. 42nd St., New York 17, N. Y.

USE REPLY CARD—CIRCLE No. 6

Dual-Spindle Vertical Grinder

. . . spindles operate individually

Vertical grinder has individually-operated spindles with individual controls that are not interlocked,



and self-centering centrifugal chucks. Left hand spindle can be operating while the right hand head is retracted for unloading and loading. When table stops at cycle's end, jaws automatically open as the centrifugal force ceases.

Panels at the operator's position have switches that set the cycle for automatic or manual control. Springfield Machine Tool Co., Dept. ST, Springfield, O.

USE REPLY CARD—CIRCLE No. 7

Thread Rolling Attachment

. . . threads close to shoulders

Thread rolling attachment, the series G2A, used in automatic screw machines and turret lathes is offered by Reed Rolled Thread Die Co., 237 Chandler St., Worcester 2, Mass. The attachment permits threading close to shoulders and, because rolling can be done on the collet end of the part behind shoulders, a secondary operation is often eliminated. This multi-purpose attachment is a geared-type unit, built in three standard sizes—$\frac{1}{2}$, $\frac{3}{4}$ and 1 inch.

The head pivots in the adapter, allowing rolls to position themselves automatically with relation

G B C

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- Expertly trained men with more than 20 years blasting experience.
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Heat Prover—not an instrument you buy, but a service we supply—helps to increase furnace productivity through these five unique advantages:

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2. **Simultaneous reading of oxygen and combustibles.**
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4. **Easy portability.**
5. **No maintenance; no re-calibration.**

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LIQUAMATTE

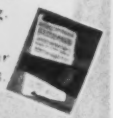
THE SIMPLIFIED METHOD OF PRECISION FINISHING

"Hand" finishes are now produced mechanically in a *matter of seconds* in the new LIQUAMATTE. A simplified method of wet blasting, the new LIQUAMATTE has 14 advanced design features that cut finishing time, reduce downtime and increase production.

The LIQUAMATTE is easier to start and more convenient to operate. Work can be handled faster with less effort. As a result, the LIQUAMATTE uniformly removes scale and grinding lines at a new low cost. It cleans tools, dies and molds with greater efficiency and holds tolerances of .0001".

Typical heat treated forging die, one half of which has been cleaned with the Liquamatte using a fine mesh Liquabrasive.

How the LIQUAMATTE lowers precision finishing costs is shown in a new bulletin which explains the 14 ways LIQUAMATTE simplifies wet blasting.



Send today for your copy of Bulletin 23

American

WHEELABRATOR & EQUIPMENT CORP.

509 S. Byrkit St., Mishawaka, Indiana

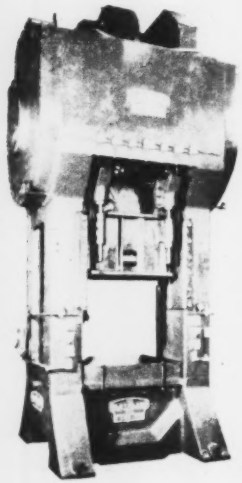
to the center line of the spindle on contact with the work.

USE REPLY CARD—CIRCLE No. 8

Double-Action Toggle Press

. . . has drum-type friction clutch

Single crank double-action toggle press, arranged for twin drive, is equipped with Cleveland drum-type friction clutch with spring-loaded brake. The press has an air counterbalanced slide and auxiliary air brake on the flywheel to bring it to a quick stop when being shut



down. The outer, or blankholder slide, has air-loaded safety links.

Press has a 20-inch stroke, 10-inch adjustment, 42-inch shut height and 48 x 48-inch bed area. Its capacity is 200 tons and operation reaches 12 strokes per minute. Pneumatic cushion in the bed has capacity of 35 tons at 100 pounds air pressure, with 9-inch travel. Cleveland Punch & Shear Works Co., Dept. ST, Cleveland 14, O.

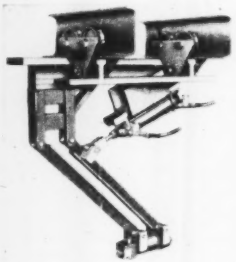
USE REPLY CARD—CIRCLE No. 9

Pneumatic Billet Marker

. . . fits above the conveyor

Two billet markers are designed specifically for stamping heat and specification numbers, analyses or special coding on hot billets. Model 601 automatically stamps sheared steel billets or ingots. Setups are possible for marking on ends or sides. Holders, which can be made for any size or number of characters, level the lettering on the billet.

Model 701, illustrated, is recommended for stamping ends of 4 x 4-inch and larger billets. Where no space is available for conventional horizontal markers, this model is built to fit above the con-



veyor, stamping billets immediately as they pass through the shears. Complete unit is mounted on a trolley to allow for positioning different billet sizes. M. E. Cunningham Co., Dept. ST, Pittsburgh 33, Pa.

USE REPLY CARD—CIRCLE No. 10

Floor Resurfacer

. . . takes heavy industrial use

A $\frac{1}{2}$-inch topping of Flexrock provides a new surface for dangerous, worn floors. It is nondusting, fire resistant, withstands vibration and will not splinter, warp or

crack. Application is easy and the floor is ready for use overnight. Flexrock Co., Dept. ST, 3630 Filbert St., Philadelphia 4, Pa.

USE REPLY CARD—CIRCLE No. 11

Portable Pipe Threader

. . . grips, centers automatically

Quijada Tool Division, Gaines-Collins, 5474 Alhambra Ave., Los Angeles 32, Calif., offers a portable

pipe, bolt and conduit threader, with power-operated chuck that eliminates use of wrenches or other manual tools in handling the pipe. Under switch operation, four jaws, front and rear, automatically grip and center the pipe.

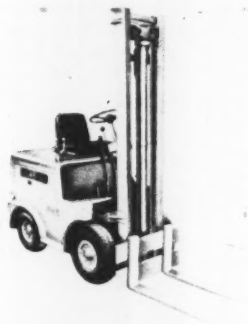
Pipe or conduit range is $\frac{3}{8}$ to 2-inches; bolt range, $\frac{3}{8}$ to $1\frac{1}{4}$-inches. Telescopic oil shaft eliminates the necessity of outside hose lines.

USE REPLY CARD—CIRCLE No. 12

Fork Lift Truck

. . . employs twin-tilt cylinders

Improvements made on the Yard-lift 20 pneumatic-tired fork lift truck include use of twin double-acting tilt cylinders. These replace



the single cylinder formerly used. Piston-type construction minimizes leakage and maintenance.

Rods are protected effectively by rubber dust boots. The 2000-pound capacity truck also has a quick-change clutch and Elliott-type steering axle. Outside turning radius is $71\frac{3}{8}$-inches. Clark Equipment Co., Dept. ST, Battle Creek, Mich.

USE REPLY CARD—CIRCLE No. 13

High-Speed Wire Cutter

. . . employs tooth-type cutters

Heavy-duty machine for cutting black tempered and other straight wires, is announced by Carlson Tool & Machine Co., Geneva, Ill. Tooth-type cutters and easy setup for adjustment of wire length to be cut combine to gain high production capacity.

Cutting capacity varies, depending on length of wire desired and

fishing for profits?

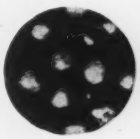
then catch on to **TRU-STEEL**

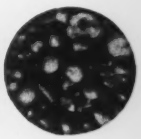
THE SHOT THAT NEVER SHATTERS

When blast cleaning abrasive starts to crumble, it loses its cleaning efficiency. Although the life of some iron abrasives has been prolonged by annealing and drawing, they still break down into the millions of sharp pieces that abrade the wearable parts of your cleaning machine.

However, a true steel shot NEVER SHATTERS. And TRU-STEEL is the only perfected true steel abrasive. Made of high-carbon steel and given a ***full*** heat treatment, it has the endurance and long life that ***only steel can give.***

TRU-STEEL after 1500 passes





CHILLED IRON after 50 passes

When you use TRU-STEEL, you save on abrasive costs, you save on maintenance material, you save on maintenance labor. How TRU-STEEL makes these savings is described in a new booklet which analyzes the cleaning dollar. Until you've tried TRU-STEEL, you can't be sure the abrasive you are using is giving you maximum life at lowest cost.

Send for your free copy of Bulletin 59-A today.

MFRD. BY STEEL SHOT PRODUCERS, INC.

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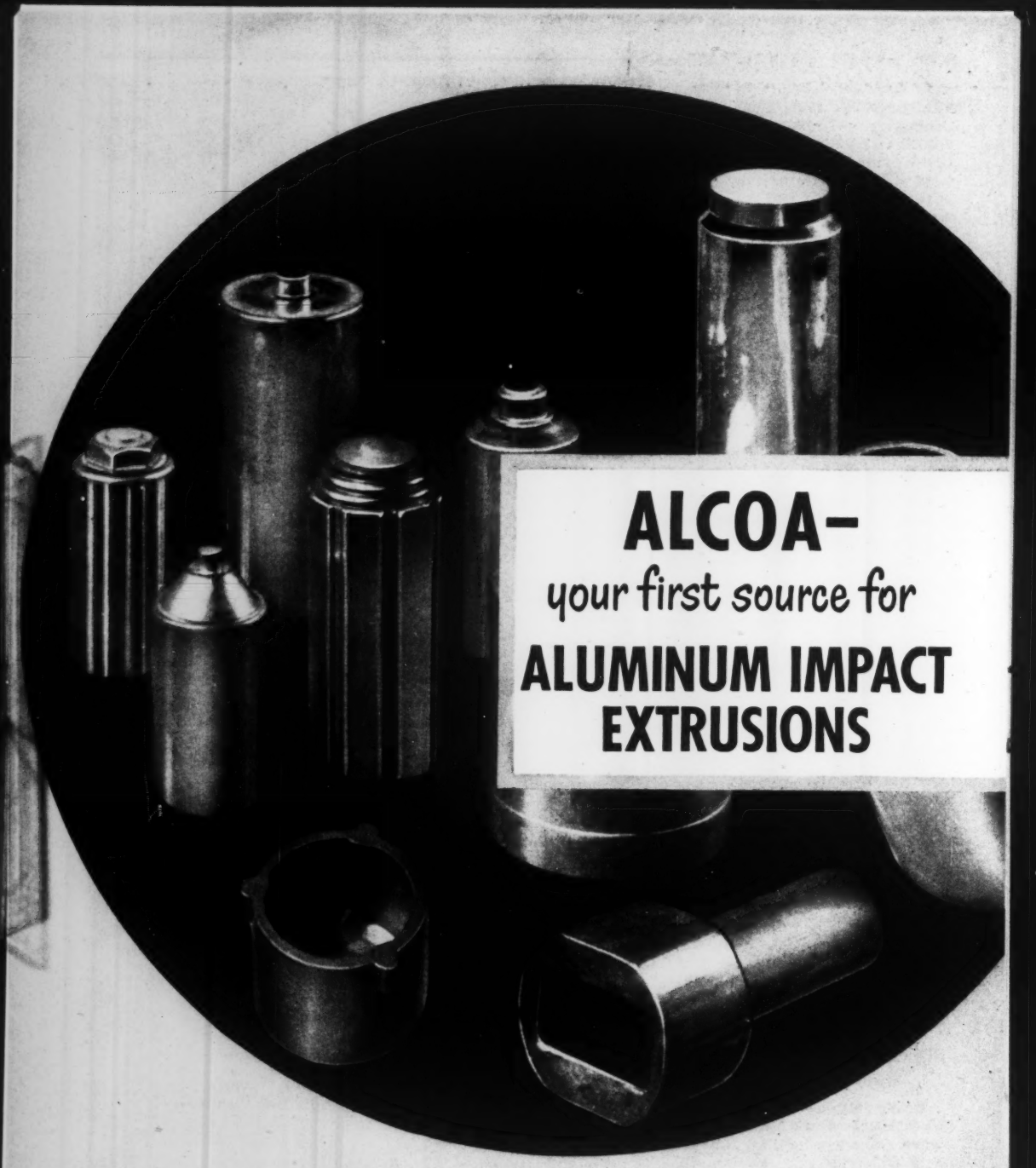
TRU-STEEL SHOT

509 S. Byrkit St., Mishawaka, Indiana

Facilities like these mean satisfaction with your source of supply



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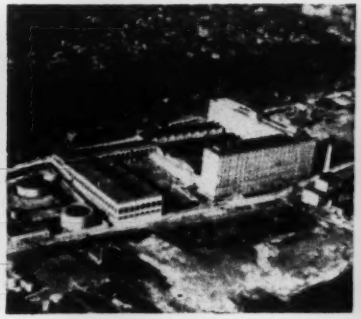
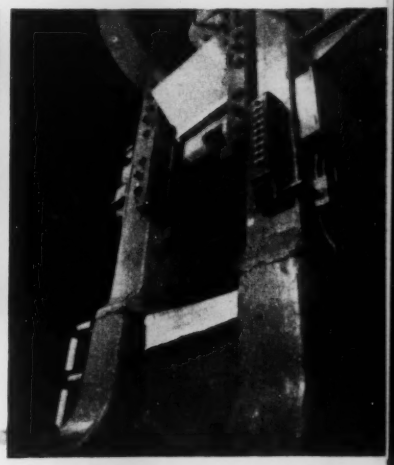
ALUMINUM COMPANY OF AMERICA

Facilities like these mean satisfaction with your source of supply—

HIGH PRODUCTION from Alcoa facilities is typified by this battery of impact-extrusion presses equipped with automatic trimming units.

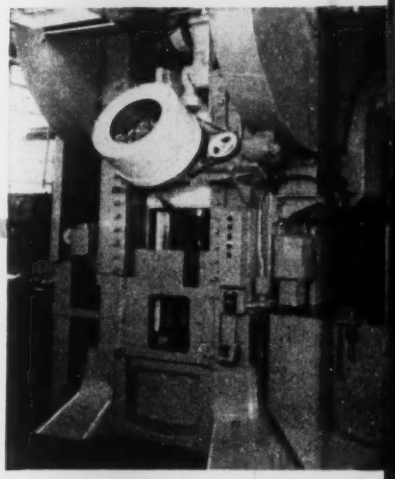


THE ALCOA PLANT, located at Edgewater, New Jersey, indicates the large impact-extruding capacity available at Alcoa. All the services of design consultation, estimating, production and secondary operations are performed here.



PRESSES OF ALL SIZES enable Alcoa to offer you facilities that permit free thinking in your engineering designs.

- Design help backed by technical literature, personal attention of Alcoa sales engineers and the facilities of the world's greatest aluminum research laboratories.
- 30 years' experience in making impact extrusions; 64 years' experience in working with aluminum.
- Ample capacity for large production runs and complete secondary operations such as flanging, flaring, beading and machining.



ALCOA'S NEW PRESSES not only extrude the desired section but trim it automatically as well.

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WL introduces *"Whelco"* – a new tool steel of M grade – a new steel of maximum toughness, hardness and strength – a steel to assure maximum results at low cost! *"Whelco"* offers great penetration of hardness, great toughness at high hardness, wide hardening range, fine grain structure, and desirable non-deforming characteristics. *"Whelco"* has good forging properties and is readily machinable in the annealed condition. All WL warehouses stock *"Whelco"* M tool steel in a wide variety of flats and squares. Call your nearest WL man for a trial order – the results will speak for themselves!

WL steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hardenability – thus eliminating costly changes in heat treating specifications.

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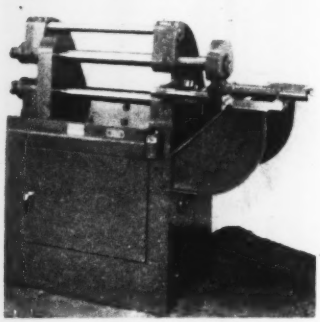
the operator's effort. Maximum is 150 pounds per hour. The machine



can be set to cut any length of wire required.

USE REPLY CARD—CIRCLE No. 14

Fire Extinguisher Cart

. . . wheeled to emergency area

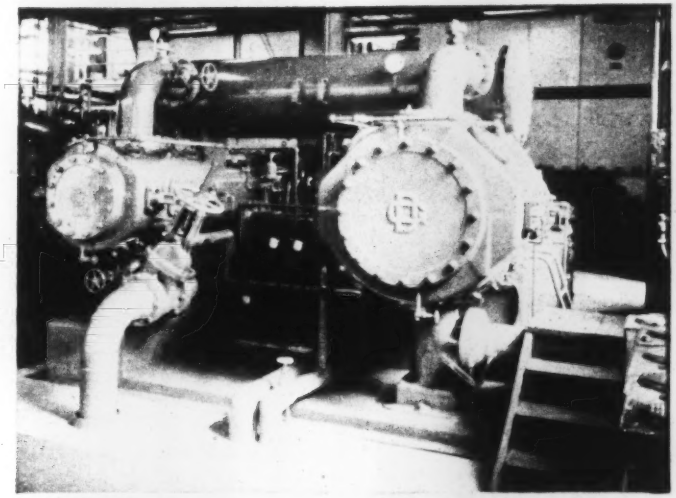
Handy Fire Dolly is a combination fire extinguisher cart equipped with three extinguishers designed to combat all types of fires. It includes Quick Aid Vapo-Liquid Fire Guard to extinguish fires caused

by gasoline, oil, grease, paints and inflammable liquids; dry chemicals Fire Guard for electrical fires; Quick Aid water-type Fire Guard, with an antifreeze charge, for inside and outside fires caused by wood, paper, textile or rubbish. General Detroit Corp., Dept. ST, 2272 E. Jefferson Ave., Detroit 7, Mich.

USE REPLY CARD—CIRCLE No. 15

Drilling Unit

Drillunit, a small, self-contained unit can be mounted on a machine in any position for extra drilling and boring jobs. Spindle is direct



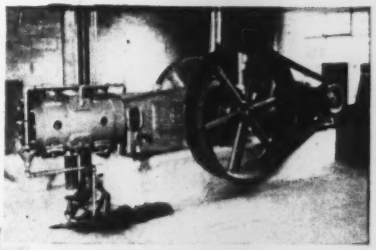
Pin Money Maintenance!

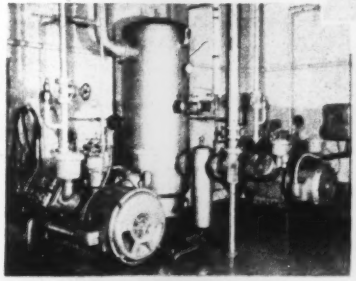
That's all it takes to keep a Gardner-Denver HA Compressor puffing away at top efficiency. One HA, for example, has been handling the full air load in a southern foundry and manufacturing plant for eight years—and has required only $10.00 for maintenance. That's $1.25 a year!

How come? A look at the soundly built power end and the reliable lubricating system will give you some of the answers.

And how about operating costs? They're unusually low, too—thanks to Gardner-Denver correctly designed air cylinders and low-lift "Air Cushioned" valves.

Another dependable compressor —the Gardner-Denver RX.





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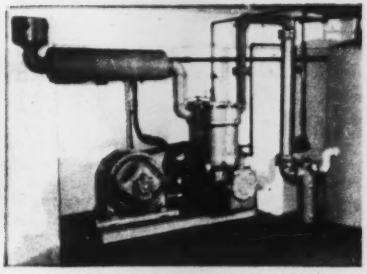

For continuous service— Gardner-Denver AA Compressors.

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Gardner-Denver Company, Quincy, Illinois
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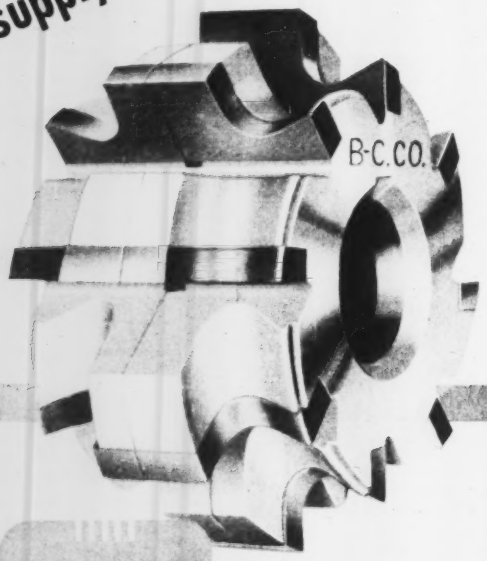

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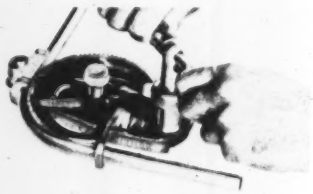
driven by an electric motor; control is by pushbutton. Speeds can be varied by changing sheaves and belts. Drillunit Inc., Dept. ST, 637 Mt. Elliott, Detroit 7, Mich.

USE REPLY CARD—CIRCLE No. 16

Gear-Type Tube Bender

. . . positioned at any point

Universal tube bender will bend any type of tubing including hard drawn copper and hard temper steel. Compact, gear-type tool can be positioned on the tube at any point. Thus, bends can be made



even when one end of the tube is connected. In its capacity are right or left-hand, return, offset and right-angle bends.

Units are made to be held by hand, clamped in a vise or bolted to a bench. A separate tool is used for each tube size from $\frac{3}{8}$ to $1\frac{1}{8}$-inch OD. Imperial Brass Mfg. Co., Dept. ST, 1200 W. Harrison St., Chicago 7, Ill.

USE REPLY CARD—CIRCLE No. 17

Buttwelding Machines

. . . join flat strips and sheets

Smooth cylinders are fabricated and flat strips and sheets are joined by two buttwelding machine models that can be operated by semiskilled workers. Units provide precise, uniform welds of the inert arc type. Specially designed workholding clamps result in strong, ductile weldments, generally without use of filler wire.

Smaller model welds seams up

USE A
REPLY CARD
Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

72. Corrugated Boxes

Hinde & Dauch Paper Co.—20-page booklet No. 5 of the "Little Packaging Library" effectively tells you "How to Ship More Economically in Corrugated Boxes." It considers correct storage of boxes till packed, correct packing, sealing, stacking and loading, knowing freight classifications and postal laws, and how the H & D package lab can help you in this respect.

73. Putting Air to Work

Westinghouse Electric Corp.—A 21-page equipment section, a 14-page putting-air-to-work application section and a 16-page engineering data section make up 60-page catalog of Westinghouse-Sturtevant products. A quick-finder chart simplifies equipment selection by cross-indexing performance and job requirements. Request catalog 600.

74. Ball Bearings

Miniature Precision Bearings, Inc.—More than 120 different types and sizes of miniature ball bearings are covered by catalog No. 52B which also gives load ratings, clearances, tolerances and installation data. Typical uses of these tiny bearings in instruments, electronic devices, controls, etc., are detailed.

75. Sand Aerators

National Engineering Co.—Proper aeration of sand is essential for maximum flowability. To get proper aeration, National Aerators will do the job. They are offered in capacities from 30 to 150 tons per hour. If you use molding sand, get a copy of bulletin 484-A. It points the way to better sand control.

76. Engine Lathes

Morey Machinery Co.—The 10-in. Mondiale Simplex engine lathes described and illustrated in 6-page bulletin are built in Belgium to American specs. Complete specifications are shown, features are detailed and accessories listed. Lathes have a 10¼-in. swing over the bed, and centers for JS and KS models are 19⅝ and 32½ in., respectively. It says delivery is good, too.

77. Surface Conditioning

Nielco Laboratories, Inc.—Complete data on the Nielizing corrosion control process are contained in 16-page illustrated booklet "Surface Conditioning Topics." This process will surface condition ferrous metal, sheets, bar stock, forgings, castings, stampings and finished machined parts. It not only cleans, but it also creates a surface on which corrosion is controlled.

78. Bulk Materials Dryers

Link-Belt Co.—24-page brochure No. 2409 offers much information on the drying, cooling and processing of bulk materials with Multi-Louvre dryers. Explanation of heat drying is provided, along with a detailed description of the dryer, how it works, typical layouts, dimensional data and a 2-page psychrometric chart. Its applications are many.

79. Gas Burner Nozzles

Hauck Mfg. Co.—Descriptions of various models of Retain-A-Flame gas burner nozzles for blast firing of air-gas mixtures into open ports of furnaces or for firing into the open without a combustion chamber are given in 4-page bulletin 804C. Burner capacities range from 40,000 to 4,200,000 Btu per hr. with 6-in. mixture pressure.

80. Lathe Accessories

South Bend Lathe Works—Hundreds of attachments and accessories for use with South Bend lathes, shapers and drill presses are described in 36-page illustrated catalog 5102. All types of tools, workholding devices and accessory shop equipment for these machine tools are detailed.

10-20-52

STEEL
Penton Building, Cleveland 13, Ohio

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81. Carbon Steel Tubing

Babcock & Wilcox Co., Tubular Products Div. Technical information for those concerned with the fabrication of equipment operating at elevated temperatures and pressures is contained in data card 132 of seamless and welded carbon steel tubing. Mechanical and physical properties as well as fabrication procedures are covered in detail.

82. Fork Truck & Tractors

Mercury Mfg. Co. Entire line of tractors, trailers, fork lift trucks, platform lift trucks and load carrying trucks is described and illustrated in the 44 pages of catalog S-200. Three main categories are the trackless train system, the fork truck-pallet system and the lift truck-skid system. Each system has an analysis of applications and merits. These, combined with equipment specifications, make No. 200 a valuable reference guide.

83. V-Drives & Accessories

Mauney Mfg. Co. In 44 pages of "V-drive Catalog and Engineering Manual" this company has crammed a wealth of buying information on fractional horsepower V-drives, drive parts and accessories, plus easy-to-read descriptions, listing and price data on line of bushed type and fixed bore type cast iron and pressed steel V-pulleys, Mor-Grip V-belts, refrigeration fans and fan pulleys. Engineering section provides much data on selecting the proper drive.

84. Electrometers

Keithley Instruments. A description and application data for vacuum tube electrometers and accessories are contained in an 8-page illustrated bulletin. Voltage, current, resistance and capacitance measurements can be made. In the 8 pages you'll find complete specifications for all models, circuit diagrams and much general information.

85. Production Dies

B. Jahn Mfg. Co. "The Story of B. Jahn Production Proved Dies" is new brochure which illustrates dies being "production proved" by running up to 50,000 parts for actual production line use before die is shipped. Typical problems overcome are shown and company's machining and manufacturing facilities are described.

86. Pressure Gages

Minneapolis-Honeywell Regulator Co., Brown Instruments Div. Here, in 4 illustrated pages, you get the construction and engineering details for Brown indicating and recording pressure gages. Made in a variety of ranges as indicators or as one, two or three-pen recorders, they are covered in specification sheet 708.

EDITORIAL REPRINTS:

87. Tooling in Record Time

Departure from the accepted pattern for designing and fabricating a complete set of tools was necessary to put aircraft components into production in six weeks at Douglas Aircraft Corp. Don K. Andreas, Industrial Engineer, Norris Engineering Co. gives the full story in STEEL reprint "Big Tooling Job Completed in Record Time."

88. Boron Steels Control

Inherent potentialities of boron steels depend directly on industry's capacity to analyze trace amounts of the element accurately. In STEEL reprint "A Key to Essential Control in Boron Steels," J. F. Rizza and L. F. Zeeb tell how it's done using the new Spectrochemical excitation unit developed by National Spectrographic Laboratories Inc.

89. Shell Molding Machine

The shell molding process has attracted wide attention in recent years because of its newness and advantages offered in the production of precision castings. Powdered Metal Products Corp. of America, which has been producing castings by this method now announce the availability to industry of its equipment and procedures. The full story is in STEEL reprint "Shell Molding: New Machine Makes It Automatic."

90. Jet Engine Rings

"How to Rough Machine Them" is title of STEEL reprint by F. Meninger of Cooper Alloy Foundry Co. which tells how a heavy-duty machine tool plus stocky carbide tools attack the tough-to-remove crust on the outside of centrifugally cast jet engine rings.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

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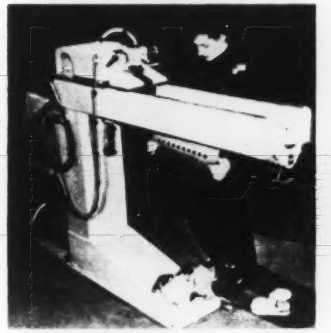
to 30 inches long; the larger unit, seams up to 66 inches long. Units are capable of handling metal thicknesses 0.025 to 0.100-inch.



Modification of models permits welding down to 0.005-inch thickness. Solar Aircraft Co., Dept ST, 2200 Pacific Highway, San Diego 12, Calif.

USE REPLY CARD—CIRCLE No. 18

Relief Grinder Speeds Cutting

. . . fixture swings 90 degrees

Grinding fixture that handles all types of cutter grinding operations is announced by Industrial Grinding Co., 1600 W. Magnolia Blvd., Burbank, Calif. Cast iron main housing supports a hardened and ground spindle on two large bearing surfaces that require only periodic oiling. The cam is hardened tool steel with steel adjustment pins. Fixture swings 90 degrees to the right or left and base is calibrated in 5-degree increments.

Developed to handle a wide variety of work, the fixture fits any standard grinder. It handles work from 1 16 to 1-inch diameter with standard collets. Lift of the single cam is variable from 0.001 to $\frac{1}{8}$-inch and adjustment pins are provided for 1, 2, 3, 4 and 6 fluted cutter grinding.

USE REPLY CARD—CIRCLE No. 19

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Here was a real finishing problem!

Run an abrasive belt over a right-angle stationary guide at 4000 feet per minute . . . smooth and polish a small, recessed area on thousands of precision-made automatic pistol stocks . . . *and still eliminate excessive belt breakage!* This was an actual problem that confronted one prominent manufacturer. Here's how Jewel Brand Abrasive Engineers helped solve it.

A small sample of scrap abrasive belting was picked at random from the plant waste barrel. This was carefully analyzed by experienced Jewel Brand Engineers. It was fully tested in terms of the type of product being finished and the material used. Then, basing their selection on the findings of the "Waste Barrel" Test combined with basic information on the job requirements, these same qualified engineers recommended a Jewel Brand Abrasive Belt that has not only eliminated excessive belt breakage but one that has consistently done a better job, faster and *at a lower cost.*

This is only one of many difficult finishing problems quickly and effectively solved by Jewel Brand Engineers. It could just as well be *your* problem . . . your plant . . . your savings! So whatever your finishing operation may be we urge you to make the easy, profitable "Waste Barrel" Test now. Simply cut out a letter-size sample of used abrasive belt . . . include the belt joint, if possible . . . and send together with completed coupon. We'll do the rest *at no obligation to you.*

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

HELP me complete the Waste Barrel Test!
Enclosed is a sample of used belt from our plant.

NAME _____ POSITION _____

COMPANY _____

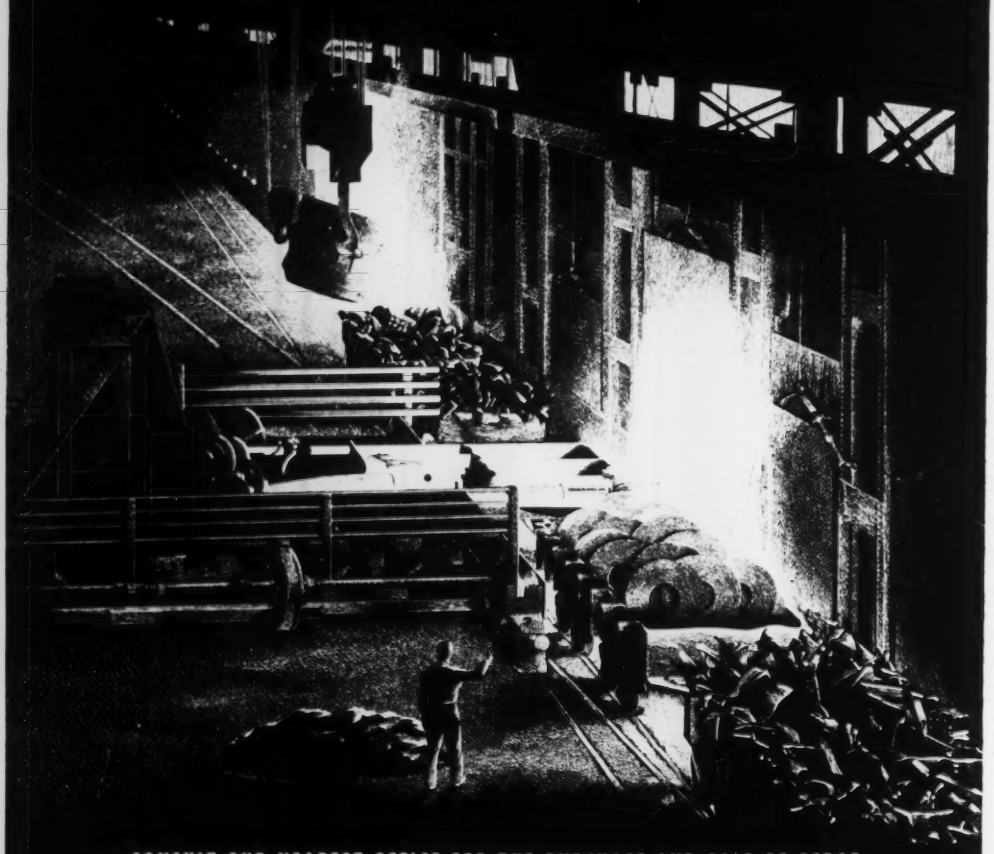
ADDRESS _____

TYPE OF PRODUCTS _____ MATERIAL _____

WE USE APPROXIMATELY _____ BELTS PER MONTH _____

BELT LENGTH _____ BELT WIDTH _____

for the purchase or sale of | *scrap*



CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

STEEL is being produced so fast the government may have to increase consumers' allotments of it for the first quarter of the coming year.

The government thought the first two months of 1953 would be needed to finish up deliveries on November and December orders that were backed up from the steelworkers' strike. But now the automobile industry bursts forth with a revelation that by the end of this year it will have "cashed" all of its 1952 "tickets" for steel for its production drive this year. "Tickets" are authorizations the government gives consumers to buy steel with under the Controlled Materials Plan.

Some auto producers say they may even try to borrow against first-quarter allocations to keep production roaring through December.

UNIVERSAL?—The question still unanswered is whether all steel consumers will be able to cash all of their 1952 CMP steel tickets by the end of this year or whether the caught-up position of the auto-industry is a result of favoritism to it, the largest consumer.

This alarm from the auto industry fanned out geographically to the Michigan governor's office, the Defense Production Administration and steel company offices. All are making an emergency check-up of the situation.

RECORD SMASHING—Hastening the arrival of a balance in supply and demand is a steel production pace that's smashing records week after week. Newest record is the production of 2,200,000 net tons of steel for ingots and castings in the week ended Oct. 18. To reach that level and break the record set in the preceding week, the industry produced at 105.5 per cent of capacity. That's a 1-point increase over the prior week.

Enabling the steel industry to set new production records now is its expansion program which is bringing new facilities into operation each week. On Jan. 1 of this year production capacity was 108.5 million net tons of steel for ingots and castings. On July 1 it was 109.3 million tons. By next Jan. 1 it will be 115.6 million tons, and some time in 1953 it is to get up to approximately 120 million tons.

PIECEMEAL—This capacity increase will not end steel shortages in one swoop. They will disappear product by product and company by company. Already some finished steel products are more plentiful than others and some companies are less laden with orders than others. How to loosen up controls on the more plentiful shapes and forms without increasing demand for the scarce items is a big problem of the government controllers. To minimize bookkeeping, CMP tickets do not specify what shapes and forms they can be used for. If more tickets are issued to cover the additional tonnage becoming available in the products in freer supply there's no guarantee those tickets won't be applied toward products such as large size bars, plates and seamless tubing that are in short supply.

HOPE—Even on some of the tightest products there are signs of improvement in supply. From Pittsburgh, the largest steel producing district in the country, comes word that the first-quarter bar supply is expected to be greater than was estimated originally. Relief for users of steel plate for civilian purposes is expected in December.

In the West, one small consumer received a mill shipment of galvanized sheets 30 days before the promised date.

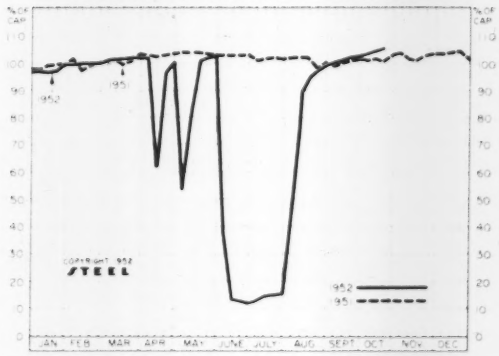
Wire mills are looking for business.

ACTIVE—Brisk activity in the automotive and appliance fields keeps a heavy demand on the cold-rolled sheet supply. Nonintegrated cold-rolled strip mills have limited space for late fourth-quarter deliveries, but their problem is to obtain hot-rolled material.

Pressure for delivery of structural shapes is slackening.

Buyers of galvanized pipe got a break pricewise from the price drops on zinc. Price discounts were increased 1 percentage point on diameters of ½ inch to 1 inch, ¾ of a point on diameters of 1¼ to 2 inches, and ½ point on diameters 2½ inches and over.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Oct. 18	Change	Same Week 1951	Same Week 1950
Pittsburgh	106	0*	100.5	105
Chicago	108	+ 1.5	95.5	102.5
Mid-Atlantic	99	+ 1	99	99
Youngstown	106	0	103	106
Wheeling	98	1.5	101.5	97
Cleveland	105.5	3.5*	101	100
Buffalo	106.5	0	104	104
Birmingham	102	0	102	100
New England	94	1	85	89
Cincinnati	93	+ 3	104	106
St. Louis	110	+ 2	98	95
Detroit	106	5	104.5	106
Western	104	+ 4	106	100
Estimated national rate	105.5	+ 1	100.5	102

Based on weekly steelmaking capacity of 2,077,040 tons in 1952, 1,999,034 tons for 1951, 1,928,721 tons for second half, 1950, 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 53 Production-Engineering News—p. 89

Composite Market Averages

FINISHED STEEL PRICE INDEX Bureau of Labor Statistics	Oct. 14 1952	Oct. 7 1952	Month Ago	September Average
Composite steel	110.1	110.1	110.1	110.1

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Oct. 11, 1952

Units are 100 lb except where otherwise noted. Items in parentheses. For complete description of products see issues following p. 28, STEEL, Sept. 1, 1952.

Rails	$5.275	Sheets, C.R. carbon	$5.275
Track spikes	6.600	Sheets, galv.	6.995
Track bolts	9.598	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (18-8)	0.329
Axles, carbon	4.145	Pipe, black, buttweld (steel)	2.660
Plates, carbon	4.100	Pipe, galv. buttweld (steel)	3.202
Structural shapes	4.200	Wire, galv. (soft)	11.025*
Bars, hot rolled (H)	4.576	Tin plate (100 lb base box)	5.950
Bars, 4120 alloy	6.525	Terne plate (100 lb base box)	7.750
Bars, stainless (18-8)	0.149	Wire, barbed, galvanized	6.075
Bars, carbon	4.100	Wire, spring, steel	9.425
Bars, reinforcing	4.000	Nails, wire (100 lb keg)	6.600
Bars, C.F. carbon	4.125	Wire, woven fence (20 rod roll)	11.220
Sheets, H.R. carbon	4.125	Wire, woven fence (height, inches)	11.220

Composite prices for selected products, average effective Sept. 16. Revised items in boldface type.

FINISHED PRICE INDEX, Weighted
Calculated by STEEL*

	Oct. 14 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 = 100)	181.31	181.31	181.31	171.92	125.06
Index (percentage)	4.912	4.912	4.912	4.657	3.388

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished steel, NT	$110.93	$110.93	$110.93	$106.32	$73.41
No. 2 Eddy. Pig Iron, GT	55.04	55.04	55.04	52.24	36.50
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.13
Malleable Pig Iron, GT	55.27	55.27	55.27	54.27	37.13
Steelmaking scrap, GT	43.00	43.00	43.00	44.00	33.50

* For explanation of weighted index see STEEL, Sept. 15, 1941, p. 94.
† Arithmetical price composites, STEEL, Sept. 1, 1952, p. 130. Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on greatest production point.

FINISHED MATERIALS	Oct. 14 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R. del. Philadelphia	4.302	4.302	4.302	4.223	3.338
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.65	3.50
Shapes, std., Pittsburgh	3.85	3.85	3.85	3.60	2.80
Shapes, std., Chicago	3.85	3.85	3.85	3.60	2.80
Shapes, std., Philadelphia	4.11	4.11	4.11	3.86	3.04
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Conshohocken, Pa.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60 75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.35
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.35
Sheets, C.R., Detroit	4.675	4.675	4.675	4.45	3.70
Sheets, galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.10	2.90
Strip, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Strip, C.R., Pittsburgh	4.30-4.80	4.30-4.80	4.30-4.80	4.05-4.55	3.35
Strip, C.R., Chicago	4.35	4.35	4.35	4.00	3.05
Strip, C.R., Detroit	4.30-4.95	4.30-4.95	4.30-4.95	4.05-4.60	3.70
Wire, Basic, Pittsburgh	4.10-5.225	4.10-5.225	4.10-5.225	4.05-5.10	3.075
Nails, Wire, Pittsburgh	6.20-6.30	6.20-6.30	6.20-6.30	6.00-6.10	4.25
Tin plate box, Pittsburgh	$8.75	$8.75	$8.75	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pittsburgh	$70.00	$70.00	$70.00	$66.00	$46.50
Wire rods, 5/16" to 1/2"	4.325	4.325	4.325	4.10-30	2.925

PIG IRON, Gross Ton					
Bessemer, Pittsburgh	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Philadelphia	59.25	59.25	59.25	56.61	38.54
No. 2 Eddy, Pittsburgh	55.00	55.00	55.00	52.50	36.50
No. 2 Eddy, Chicago	55.00	55.00	55.00	52.50	36.50
No. 2 Eddy, Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Eddy, Phila.	59.75	59.75	59.75	57.11	39.04
No. 2 Eddy, Birm.	54.38	54.38	54.38	49.88	34.88
No. 2 Eddy, Birm., del. Cin.	58.93	58.93	58.93	55.43	38.54
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Malleable, Lyons, Tenn.	58.50	58.50	58.50	56.00	44.00
Ferromanganese, 80% Pa.	225.00	225.00	225.00	188.00	131.00*

* Each cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$43.00	$43.00	$44.00	$43.00	$40.50
No. 1 Heavy Melt, Phila.	41.00	41.00	41.00	44.00	40.00
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	43.50	38.75
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	45.00	40.50
No. 1 Heavy Melt, Cleve.	43.00	43.00	43.00	44.00	38.25
No. 1 Heavy Melt, Buffalo	43.00	43.00	43.00	44.00	39.50
Rails, Rerolling, Chicago	52.00	52.00	52.00	52.00	41.50
No. 1 Cast, Chicago	47.00	47.00	47.00	48.00	47.50

Each cars, Pittsburgh.

COKE, Net Ton					
Furnace, Connellsville	$14.75	$14.75	$14.75*	$14.75	$12.00-12.75
Beehive, Ft. Cumberland	17.00	17.00	17.00	17.00	14.00-15.00
Oven, Ft. Cumberland	21.00	21.00	21.00	21.00	17.00

PIG IRON

Basic furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% fed eral tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malle able	Besse mer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
New York, del.		60.78	61.28	
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
Alabama City, Ala. B2	50.38	51.38		
Birmingham, B2	50.38	51.38		
Birmingham, S6		51.38		
Woodward, Ala. W15	50.38	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo, B2	54.50	55.00	55.50	
Buffalo, H1	54.50	55.00	55.50	
Tonawanda, N.Y. W12	54.50	55.00	55.50	
No. Tonawanda, N.Y. P6		55.00	55.50	
Boston, del.	60.15	60.65	60.15	
Rochester, N.Y. del.	57.72	58.02	58.52	
Syracuse, N.Y. del.	58.62	59.12	59.62	
Chicago District				
Chicago, I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50		55.00	
Indiana Harbor, Ind. I-2	54.50		55.00	
So. Chicago, Ill. W14	54.50	55.00	55.00	
So. Chicago, Ill. Y1	54.50	55.00	55.00	
So. Chicago, Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich. del.		61.30	61.30	
Cleveland District				
Cleveland, A7	54.50	55.00	55.00	55.50
Cleveland, R2	54.50	55.00	55.00	
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O., N3	54.50			55.50
Painesville, O., R5			55.00	
Erie, Pa., I-3	54.50	55.00	55.00	55.50
Everett, Mass., E1		59.25	59.75	
Fontana, Calif., K1	60.50	61.00		
Granite City, Ill., G4	56.40	56.90	57.40	
St. Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton, Utah, C11	54.50	55.00		
Geneva, Utah, C11	54.50	55.00		
Lone Star, Tex., L6	56.50	*51.00	51.00	
Minnequa, Colo., C10	56.50	57.00	57.50	
Rockwood, Tenn., T3			58.50	
Pittsburgh District				
Neville Island, Pa., P6		55.00	55.00	55.50
Pitts., N. & S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKees Rocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Mingo, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.13	57.13	57.63
Brackenridge, del.		57.45	57.45	57.95
Bessemer, Pa., U5	54.50		55.00	55.50
Clairton, Rankin, So. Duquesne, Pa., U5	54.50			
McKeesport, Pa., N3	54.50			55.50
Monessen, Pa., P7	56.50			
Sharpsville, Pa., S6			55.00	55.50
Warren, O., R2	56.50	57.00	57.50	58.00
Sweedeland, Pa., A9	58.50	59.00	59.50	60.00
Toledo, O., I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy, N.Y., R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O., Y1	54.50	55.00	55.00	
Youngstown, Y1	54.50	55.00	55.00	
Youngstown, U5	54.50			55.50
Mansfield, O., del.	59.14	59.65	59.65	60.15

* Low phos. southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% on that portion thereof.

Nickel: Under 0.50%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add $1.00 for each 0.5% Si)

Jackson, O., G2, J1	$65.50
Buffalo, H1	*66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max. P)

Niagara Falls, N.Y., P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12% lb pigiets, 16% Si, frt. allowed K2	93.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn., T4	$65.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa., B2	62.50
Philadelphia, delivered	60.05
Troy, N.Y., R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL Oct. 16, 1952 cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on next two page.

INGOTS, Carbon, Forging (NT)
Fontana Calif. K1 $81.00
Midland Pa. C6 84.00
Seattle S24 75.00

INGOTS, Alloy (NT)
Detroit R7 $87.00
Fontana Calif. K1 83.00
Houston S5 80.00
Midland Pa. C18 84.00
Munhall Pa. U5 87.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer Pa. U5 $59.00
Clairton Pa. U5 59.00
Ensley Ala. T2 59.00
Fairfield Ala. T2 59.00
Fontana Calif. K1 59.00
Gary, Ind. U5 59.00
Johnstown Pa. B2 59.00
Lackawanna N.Y. B2 59.00
Munhall Pa. U5 59.00
So Chicago Ill. U5 59.00
So Duquesne Pa. U5 59.00
Carbon, Forging (NT)
Bessemer Pa. U5 $70.50
Buffalo R2 70.50
Canton O. R2 70.50
Clairton Pa. U5 70.50
Cleveland R2 70.50
Coatesville Pa. A3 77.50
Detroit R7 73.50
Ensley Ala. T2 70.50
Fairfield Ala. T2 70.50
Fontana Calif. K1 70.50
Gary, Ind. U5 70.50
Geneva, Utah C11 70.50
Houston S5 70.50
Johnstown Pa. B2 70.50
Lackawanna N.Y. B2 70.50
Los Angeles B3 70.50
Munhall Pa. U5 70.50
Seattle B3 70.50
So Chicago R2 U5 W14 70.50
So Duquesne Pa. U5 70.50
So San Francisco B3 70.50
Alloy, Forging (NT)
Bethlehem Pa. B2 $76.00
Buffalo R2 76.00
Canton O. R2 76.00
Carlton O. T7 76.00
Coatesville Pa. A3 76.00
Detroit R7 76.00
Fontana Calif. K1 76.00
Gary, Ind. U5 76.00
Houston S5 84.00
Ind Harbor Ind. Y1 76.00
Johnstown Pa. B2 76.00
Lackawanna N.Y. B2 76.00
Los Angeles B3 76.00
Massillon O. R2 76.00
Midland Pa. C18 76.00
Munhall Pa. U5 76.00
So Chicago R2 U5 W14 76.00
So Duquesne Pa. U5 76.00
Struthers O. Y1 76.00
Warren O. C17 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $87.50
Canton O. R2 87.50
Cleveland R2 87.50
Fontana Calif. K1 101.50
Gary, Ind. U5 87.50
Massillon O. R2 87.50
So Chicago Ill. R2 87.50
So Duquesne Pa. U5 87.50

SHEET BARS (NT)
Fontana Calif. K1 $80.00

SKELP
Aliquippa Pa. J5 $3.65
Munhall Pa. U5 3.55
Warren O. R2 3.55
Youngstown R2 U5 3.55

WIRE RODS
Alton, Ill. L1 4.20
AlabamaCity Ala. R2 4.325
Buffalo W12 4.325
Cleveland A7 4.325
Donora Pa. A7 4.325
Fairfield Ala. T2 4.325
Fontana Calif. K1 4.325
Houston S5 4.325
Johnstown Pa. B2 4.325
Joliet Ill. A7 4.325
KansasCity Mo. S5 4.665
LosAngeles B3 5.125
Minnequa Colo. C10 4.375
Monessen Pa. P12 4.325
No Tonawanda N.Y. B11 4.325
Pittsburg Calif. C11 4.975
Portsmouth O. P12 4.525
Sparrows Point Md. B2 4.425
Sterling Ill. (4) N15 4.325
Struthers O. Y1 4.325
Torrance Calif. C11 5.125
Worcester Mass. A7 4.625

SHEET STEEL PILING
Ind Harbor Ind. I-2 4.675
Lackawanna N.Y. B2 4.675
Munhall Pa. U5 4.675
So Chicago Ill. U5 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity Ala. R2 3.85
Aliquippa Pa. J5 3.85
Bessemer Ala. T2 3.85
Bethlehem Pa. B2 3.90
Clairton Pa. U5 3.85
Fairfield Ala. T2 3.85
Fontana Calif. K1 4.45
Gary Ind. U5 3.85
Geneva, Utah C11 3.85
Houston S5 4.25
Ind Harbor Ind. I-2 3.85
Johnstown Pa. B2 3.90
KansasCity Mo. S5 4.45
Lackawanna N.Y. B2 3.90
LosAngeles B3 4.45
Minnequa Colo. C10 4.30
Munhall Pa. U5 3.85
Niles Calif. (22) P1 4.06
PhoenixVille Pa. P4 4.10
Seattle B3 4.50
So Chicago Ill. U5 W14 3.85
So SanFrancisco B3 4.45
Torrance Calif. C11 4.45
Weirton W.Va. W6 4.10
Wide Flange
Bethlehem Pa. B2 3.90
Clairton Pa. U5 3.85
Fontana Calif. K1 4.85
Johnstown Pa. B2 3.90
Lackawanna N.Y. B2 3.90
Munhall Pa. U5 3.85
So Chicago Ill. U5 3.85
Alloy Stand. Shapes
Clairton Pa. U5 4.725
Fontana Calif. K1 5.925
Gary Ind. U5 4.725
Munhall Pa. U5 4.725
So Chicago Ill. U5 4.725
H.S., L.A. Stand. Shapes
Aliquippa Pa. J5 3.80
Bessemer Ala. T2 3.80
Bethlehem Pa. B2 3.80
Clairton Pa. U5 3.80
Fairfield Ala. T2 3.80
Fontana Calif. K1 4.40
Gary Ind. U5 3.80
Geneva, Utah C11 3.80
Ind Harbor Ind. I-2 3.80
Ind Harbor Ind. Y1 3.80
Johnstown Pa. B2 3.80
Lackawanna N.Y. B2 3.80
LosAngeles B3 4.35
Munhall Pa. U5 3.80
Seattle B3 4.40
So Chicago Ill. U5 3.80
So SanFrancisco B3 4.30
Struthers O. Y1 3.80
H.S., L.A. Wide Flange
Aliquippa Pa. J5 3.80
Bethlehem Pa. B2 3.80
Lackawanna N.Y. B2 3.80
Munhall Pa. U5 3.75
So Chicago Ill. U5 3.75
BEARING PILES
Munhall Pa. U5 3.85
So Chicago Ill. U5 3.85

PLATES, High-Strength Low-Alloy
Aliquippa Pa. J5 3.95
Bessemer Ala. T2 3.95
Clairton Pa. U5 3.95
Cleveland J5 R2 3.95
Conshohocken Pa. A3 6.20
Coatesville Pa. L7 6.00
Fairfield Ala. T2 3.95
Fontana Calif. (30) K1 6.55
Gary Ind. U5 3.95
Geneva, Utah C11 3.95
Ind Harbor Ind. I-2 3.95
Ind Harbor Ind. Y1 3.95
Johnstown Pa. B2 3.95
Munhall Pa. U5 3.95
Pittsburgh J5 3.95
Seattle B3 4.85
Sharon Pa. S3 3.95
So Chicago Ill. U5 3.95
Sparrows Point, Md. B2 3.95
Warren O. R2 3.95
Youngstown Y1 3.95
Youngstown U5 3.95
PLATES, Open-Hearth Alloy
Claymont, Del. C22 5.35
Coatesville Pa. L7 5.75
Conshohocken Pa. A3 5.75
Fontana Calif. K1 7.25
Gary Ind. U5 5.20
Johnstown Pa. B2 5.20
Munhall Pa. U5 5.20
Sharon Pa. S3 5.20
So Chicago Ill. U5 5.20
Sparrows Point, Md. B2 5.20
FLOOR PLATES
Cleveland J5 4.95
Conshohocken Pa. A3 4.95
Ind Harbor Ind. I-2 4.95
Munhall Pa. U5 4.95
So Chicago Ill. U5 4.95

PLATES, Ingot Iron
Ashland (45) A10 4.15
Cleveland J5 R2 4.50
Warren O. (5) R2 4.50

PLATES, Carbon Steel
Alabama City Ala. R2 3.90
Aliquippa Pa. J5 3.90
Ashland Ky. (45) A10 3.90
Bessemer Ala. T2 3.90
Clairton Pa. U5 3.90
Claymont Del. C22 4.35
Cleveland J5 R2 4.35
Coatesville Pa. L7 4.25
Conshohocken Pa. A3 4.35
Ecorse Mich. G5 4.45
Fairfield Ala. T2 3.90
Fontana Calif. (30) K1 4.50
Gary Ind. U5 3.90
Geneva, Utah C11 3.90
Granite City Ill. G4 4.60
Harrisburg Pa. C6 6.50
Houston S5 4.30
Ind Harbor Ind. I-2 Y1 3.90
Johnstown Pa. B2 3.90
Lackawanna N.Y. B2 3.90
Minnequa Colo. C10 4.75
Munhall Pa. U5 3.90
Pittsburgh J5 3.90
Seattle B3 4.50
Sharon Pa. S3 4.15
So Chicago Ill. U5 W14 3.90
Steubenville O. W10 3.90
Warren O. R2 3.90
Weirton W.Va. W6 4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A-R
Fontana Calif. K1 5.60
Geneva, Utah C11 5.60

PLATES, Wrought Iron
(Add 4 c. to base and extras)
Economy Pa. B14 8.60

BARS, Hot-Rolled Carbon
AlabamaCity Ala. R2 3.95
Aliquippa Pa. J5 3.95
Alton Ill. L1 4.20
Atlanta Ga. A11 4.50
Bessemer Ala. T2 3.95
Buffalo R2 3.95
Canton O. R2 3.95
Clairton Pa. U5 3.95
Cleveland R2 3.95
Detroit R7 4.10
Ecorse Mich. G5 4.30
Emeryville Calif. J7 4.70
Fairfield Ala. T2 3.95
Fontana Calif. K1 4.65
Gary Ind. U5 3.95
Houston S5 4.35
Ind Harbor Ind. I-2 Y1 3.95
Johnstown Pa. B2 3.95
Kansas City Mo. S5 4.65
Lackawanna N.Y. B2 3.95
LosAngeles B3 4.65
Milton Pa. B6 4.55
Minnequa Colo. C10 4.40
Niles Calif. P1 4.65
N.Tonawanda N.Y. B11 3.95
Pittsburg Calif. C11 4.65
Pittsburgh J5 3.95
Seattle B3, N14 4.70
So Chicago R2 U5 W14 3.95
So Duquesne Pa. U5 3.95
So SanFran. Cal. B3 4.70
Sterling Ill. N15 4.65
Struthers O. Y1 3.95
Torrance Calif. C11 4.65
Weirton W.Va. W6 4.10
Youngstown R2, U5 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa Pa. J5 3.95
Atlanta A11 4.50
Niles Calif. P1 4.65
SanFrancisco S7 5.00

BAR SIZE ANGLES, H.R CARBON
Bethlehem Pa. B2 4.15

BARS, Hot-Rolled Alloy
Bethlehem Pa. B2 4.075
Buffalo R2 4.075
Canton O. R2 4.075
Canton O. T7 4.225
Clairton Pa. U5 4.075
Detroit R7 4.225
Ecorse Mich. G5 5.025
Fontana Calif. K1 5.725
Gary Ind. U5 4.075
Houston S5 4.275
Ind Harbor Ind. I-2 Y1 4.075
Johnstown Pa. B2 4.075
Kansas City Mo. S5 5.275
Lackawanna N.Y. B2 4.075
LosAngeles B3 5.725
Massillon O. R2 4.075
Midland Pa. C18 4.30
So Chicago R2 U5 W14 4.075
So Duquesne Pa. U5 4.075
Struthers O. Y1 4.075
Warren O. C17 4.075
Youngstown U5 4.075

BAR SHAPES, Hot-Rolled Alloy
Clairton Pa. U5 4.925
Gary Ind. U5 4.925
Youngstown U5 4.925

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa Pa. J5 5.925
Bessemer Ala. T2 5.925
Bethlehem Pa. B2 5.925
Clairton Pa. U5 5.925
Cleveland R2 5.925
Ecorse Mich. G5 6.625
Fairfield Ala. T2 5.925
Fontana Calif. K1 6.675
Gary Ind. U5 5.925
Ind Harbor Ind. I-2 5.925
IndianaHarbor Ind. Y1 6.625
Johnstown Pa. B2 5.925
Lackawanna N.Y. B2 5.925
Los Angeles B3 6.625
Pittsburgh J5 5.925
Seattle B3 6.625
So Duquesne Pa. U5 5.925
So SanFrancisco B3 6.675
Struther O. Y1 6.425
Youngstown U5 5.925

BARS, Cold-Finished Carbon
Ambridge Pa. W8 4.925
BeaverFalls Pa. R2 4.925
BeaverFalls Pa. M12 4.925
Buffalo B5 4.925
Camden N.J. P13 4.95
Carnegie Pa. C12 4.925
Chicago B5 4.925
Chicago W18 4.925
Cleveland A7, C20 4.925
Detroit P17, R7 5.025
Donora Pa. A7 4.925
Elyria O. W8 4.925
FranklinPark Ill. N5 4.925
Gary Ind. R5 4.925
GreenBay Wis. F7 4.925
Hammond Ind. L2, M13 4.925
Hartford Conn. R2 5.475
LosAngeles B2 6.375
Mansfield Mass. B5 5.475
Mass Ill. (4) R2, R8 4.925
Monaca Pa. S17 4.925
Newark N.J. W18 5.475
Plymouth Mich. P6 5.175
Pittsburgh J5 4.925
Putnam Conn. W18 5.475
readville Mass. C14 5.475
St Louis Mo. M5 5.200
So Chicago Ill. W14 4.925
SpringCity Pa. K3 5.375
Struthers O. Y1 4.925
Waukegan Ill. A7 4.925
Youngstown Y1 4.925
Youngstown R2 4.925

BARS, Cold-Finished Alloy
Ambridge Pa. W18 6.00
BeaverFalls Pa. M12 6.00
Bethlehem Pa. B2 6.00
Buffalo B5 6.00
Camden N.J. P13 6.40
Canton O. R2 6.00
Canton O. T7 6.00
Carnegie Pa. C12 6.00
Chicago B5 6.00
Chicago W18 6.00
Cleveland A7 6.00
Cleveland C20 6.00
Detroit P17, R7 6.15
Donora Pa. A7 6.00
Elyria O. W8 6.00
Gary Ind. R5 6.00
Hammond Ind. L2, M13 6.00
Hartford Conn. R2 6.40
Lackawanna N.Y. B2 6.00
Manfield Mass. B5 6.40
Massillon O. R8 6.00
Midland Pa. C18 5.40
Monaca Pa. S17 6.00
Newark N.J. W18 6.35
Plymouth Mich. P6 6.20
So Chicago Ill. R2, W14 6.00
SpringCity Pa. K3 6.20
Struthers O. Y1 6.00
Warren O. C17 6.00
Waukegan Ill. A7 6.05
Worcester Mass. A7 6.35
Youngstown Y1 6.00
Youngstown R3 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity Ala. R2 3.95
Atlanta A11 4.50
Buffalo R2 3.95
Cleveland R2 3.95
Emeryville Calif. J7 4.70
Fairfield Ala. T2 3.95
Fontana Calif. K1 4.65
Gary Ind. U5 3.95
Houston S5 4.35
Ind Harbor Ind. I-2 Y1 3.95
Johnstown Pa. B2 3.95
KansasCity Mo. S5 4.65
Lackawanna N.Y. B2 3.95
Los Angeles B3 4.65
Milton Pa. B6 4.55
Minnequa Colo. C10 4.40
Niles Calif. P1 4.65
Pittsburg Calif. C11 4.65
Pittsburgh J5 3.95
SandSprings Okla. S5 4.85
Seattle B3, N14 4.70
So Chicago Ill. R2 3.95
So Duquesne Pa. U5 3.95
So SanFrancisco B3 4.70
Sparrows Point Md. B2 3.95
Sterling Ill. N15 4.65
Struthers O. Y1 3.95
Torrance Calif. C11 4.65
Youngstown R2, U5 3.95

BARS, Reinforcing
(Fabricated to Consumers)
Huntington W.Va. W7 5.50
Johnstown, Pa. B2 5.45
LosAngeles B3 5.95
Marion O. P11 5.25
Seattle B3, N14 5.80
So SanFrancisco B3 5.45
SparrowsPt. Md. B2 4.75
Williamsport Pa. S19 5.10

RAIL STEEL BARS
Chicago Hts (34) C2 4.75
Chicago Hts (44) I-2 4.75
Franklin Pa (34) F5 4.75
FortWorth Tex (26) T4 5.10
Huntington W.Va. (3) W7 5.75
Marion O. (3) P11 4.75
Moline Ill. (3) R2 4.00
Tonawanda (34) B12 5.00
Williamsport (4) S19 5.25
Williamsport (4) S19 5.35

BARS, Wrought Iron
(Add 4 c. to base and extras)
Economy Pa. (8 R.) B14 9.60
Economy Pa. (12 R.) B14 11.00
Economy Staybolt B14 12.20
Mer. Rks. (8 R.) Staybolt L5 14.50
Mer. Rks. (8 R.) L5 9.60
Mer. Rks. (12 R.) L5 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity Ala. R2 3.775
Ashland Ky. (45) A10 3.775
Butler Pa. A10 3.775
Cleveland J5 R2 3.775
Conshohocken Pa. A3 4.175
Detroit M1 4.40
Ecorse Mich. G5 3.975
Fairfield Ala. T2 3.775
Fontana Calif. K1 4.225
Gary Ind. U5 3.775
Geneva, Utah C11 3.875
Granite City Ill. G4 4.20
Ind Harbor Ind. I-2 Y1 3.775
Irvin Pa. U5 3.775
Lackawanna N.Y. B2 3.775
Mansfield Pa. M15 3.775
Niles O. N12 3.825
Pittsburg Calif. C11 4.475
Pittsburgh J5 3.775
Sharon Pa. S3 4.175
So Chicago Ill. W14 3.775
Sparrows Point Md. B2 3.775
Stubenville O. W10 3.775
Torrance Calif. C11 4.475
Warren O. R2 3.775
Weirton W.Va. W6 3.775
WestLeechburg Pa. A1 3.924
Youngstown Y5, Y1 3.775

SHEETS, H.R (19 gage)
AlabamaCity Ala. R2 4.925
Dover O. R1 5.825
Mansfield O. E6 5.65
Niles O. N12 5.675
Torrance Calif. C11 5.575

SHEETS, H.R (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5 R2 5.675
Conshohocken Pa. A3 5.924
Ecorse Mich. G5 6.225
Fairfield Ala. T2 5.675
Fontana Calif. K1 6.625
Gary Ind. U5 5.675
Ind Harbor Ind. I-2 5.675
Ind Harbor Ind. Y1 5.675
Irvin Pa. U5 5.675
Lackawanna (35) B2 5.675
Munhall U5 5.675
Pittsburgh J5 5.675
Sharon Pa. S3 5.675
So Chicago Ill. U5 5.675
Sparrows Point (36) B2 5.675
Warren O. R2 5.675
Weirton W.Va. W6 6.025
Youngstown U5 5.675
Youngstown Y1 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5 R2 6.925
Ecorse Mich. G5 7.475
Fontana Calif. K1 7.875
Gary Ind. U5 6.925
IndianaHarbor Ind. Y1 7.425
IndianaHarbor Ind. I-2 6.925
Irvin Pa. U5 6.925
Lackawanna (37) B2 6.925
Pittsburgh J5 6.925
SparrowsPoint (36) B2 6.925
Warren O. R2 6.925
Weirton W.Va. W6 7.275
Youngstown Y1 7.425

SHEETS Cold Rolled Steel (Commercial Quality)

Buffalo, N.Y.	A10
Cleveland, O.	B2
Detroit, Mich.	A10
Fairfield, Ala.	T2
Gary, Ind.	U
Granite City, Ill.	A14
Pittsburgh, Pa.	P10
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS Galv'd No. 10 Steel

Buffalo, N.Y.	B2
Cleveland, O.	A7
Detroit, Mich.	D2
Fairfield, Ala.	T2
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Kokomo, Ind.	K2
Middletown, O.	A10
Pittsburgh, Pa.	P10
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS Galvanized No. 10 High Strength Low Alloy

Buffalo, N.Y.	B2
Cleveland, O.	A7
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2

SHEETS Galvannealed Steel

Buffalo, N.Y.	B2
Cleveland, O.	A7
Detroit, Mich.	D2
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS ZINCGRIP Steel No. 10

Middletown, O.	A10
Warren, O.	R2

SHEETS Electro Galvanized

Ashland, Ky.	A10
Buffalo, N.Y.	B2
Cleveland, O.	A7
Detroit, Mich.	D2
Weirton, W. Va.	W6

SHEETS Weil Casing

Fairfield, Ala.	T2
Gary, Ind.	U

BLUED Stock 29 ga.

Niles, O.	N2
Warren, O.	R2

SHEETS Enameling Iron

Ashland, Ky.	A10
Cleveland, O.	A7
Gary, Ind.	U
Granite City, Ill.	A14
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Niles, O.	N2
Pittsburgh, Pa.	P10
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

TIN PLATE Electrolytic Base Box

	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa.	$7.40	$7.60	$7.80
Fairfield, Ala.	7.40	7.60	7.80
Gary, Ind.	7.40	7.60	7.80
Granite City, Ill.	7.40	7.60	7.80
Ind. Harbor, Ind.	7.40	7.60	7.80
Ivy, Pa.	7.40	7.60	7.80
Niles, O.	7.40		
Pittsburg, Calif.	7.55	7.75	7.95
Sparrows Point, Md.	7.40	7.60	7.80
Weirton, W. Va.	7.40	7.60	7.80
Yorkville, O.	7.40	7.60	7.80

SHEETS SILICON H R or C R (22 Ga.)

COILS (Cut lengths 12c lower)

	Field	Armature	Electric	Motor	Dynamo
Beech Bottom, W. Va.				14	10
Brackenridge, Pa.					
Granite City, Ill.					
Indiana Harbor, Ind.				14	10
Mansfield, O.					
Niles, O.				14	10
Vandergrift, Pa.					
Warren, O.					
Weirton, W. Va.					

SHEETS SILICON (22 Ga. Base)

COILS (Cut Lengths 12c lower)

	Transformer Grade			
Beech Bottom, W. Va.	72	65	58	52
Brackenridge, Pa.				
Granite City, Ill.				
Indiana Harbor, Ind.				
Vandergrift, Pa.				
Warren, O.				
Weirton, W. Va.				

H R or C R COILS AND CUT LENGTHS SILICON (22 Ga.)

Butler, Pa.	T100	T90	T80	T71
Vandergrift, Pa.				

BLACK PLATE Base Box

Aliquippa, Pa.	$6.25
Fairfield, Ala.	6.00
Gary, Ind.	6.00
Ind. Harbor, Ind.	6.00
Irvin, Pa.	6.00
Niles, O.	6.00
Pittsburg, Calif.	7.20
Sparrows Point, Md.	6.00
Warren, O.	6.00
Weirton, W. Va.	6.00
Yorkville, O.	6.00

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee, W. Va.	F1
Gary, Ind.	U
Granite City, Ill.	A14
Ind. Harbor, Ind.	Y1
Warren, O.	R2
Weirton, W. Va.	W6

SHEETS Culvert No. 16 Copper Alloy

Ashland, Ky.	A10
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2
Weirton, W. Va.	W6

SHEETS Culvert No. 16 Pure Iron

Ashland, Ky.	A10
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2
Weirton, W. Va.	W6

SHEETS Hot Rolled Ingot Iron 18 Gage and Heavier

Ashland, Ky.	A10
Butler, Pa.	A10
Cleveland, O.	A7
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS Cold Rolled Ingot Iron

Butler, Pa.	A10
Cleveland, O.	A7
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS Galvanized Ingot Iron No. 10 flat

Ashland, Ky.	A10
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Middletown, O.	A10
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

SHEETS ZINCGRIP Ingot Iron

Butler, Pa.	A10
Middletown, O.	A10

SHEETS ALUMINIZED

Butler, Pa.	A10

TINPLATE American 1.25 1.50

Coke (Base Box)	lb	lb
Aliquippa, Pa.	$7.20	$7.40
Fairfield, Ala.	7.20	7.40
Gary, Ind.	7.20	7.40
Ind. Harbor, Ind.	7.20	7.40
Irvin, Pa.	7.20	7.40
Middletown, O.	7.20	7.40
Niles, O.	7.20	7.40
Warren, O.	7.20	7.40
Weirton, W. Va.	7.20	7.40
Yorkville, O.	7.20	7.40

MANUFACTURING TERNES (Special Coated)

Fairfield, Ala.	T2
Gary, Ind.	U
Irvin, Pa.	P7
Yorkville, O.	Y1

SHEETS LT Coated Ternes 6 lb

Yorkville, O.	Y1

SHEET Mfg Ternes 8 lb (Commercial Quality)

Gary, Ind.	U
Yorkville, O.	Y1

SHEET Long Terne Steel (Commercial Quality)

Beech Bottom, W. Va.	W10
Gary, Ind.	U
Maryland, O.	F6
Middletown, O.	A10
Niles, O.	N2
Weirton, W. Va.	W6

SHEETS Long Terne Ingot Iron

Middletown, O.	A10

ROOFING SHORT TERNES (8 lb Coated)

Gary, Ind.	U

STRIP Hot Rolled High Strength Low Alloy

Beaumont, Tex.	S4
Conshohocken, Pa.	A3
Ecorse, Mich.	G5
Fairfield, Ala.	T2
Gary, Ind.	U
Ind. Harbor, Ind.	Y1
Lackawanna, N.Y.	B2
Los Angeles, Calif.	B3
Seattle, Wash.	S2
San Francisco, Calif.	B3
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

STRIP Cold Rolled High Strength Low Alloy

Cleveland, O.	A7
Detroit, Mich.	D2
Ecorse, Mich.	G5
Lackawanna, N.Y.	B2
Niles, O.	N2
Sparrows Point, Md.	B2
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

STRIP Hot Rolled Carbon

Alton, Ill.	A14
Ashland, Ky.	A10
Atlanta, Ga.	A11
Bessemer, Ala.	T2
Bridgeport, Conn.	S15
Buffalo, N.Y.	B2
Butler, Pa.	A10
Carnegie, Pa.	S15
Cleveland, O.	A7
Detroit, Mich.	D2
Ecorse, Mich.	G5
Fairfield, Ala.	T2
Fontana, Calif.	K1
Gary, Ind.	U
Harrison, N.J.	C15
Ind. Harbor, Ind.	Y1
Irvin, Pa.	P7
Kansas City, Mo.	S8
Lackawanna, N.Y.	B2
Los Angeles, Calif.	B3
Middletown, O.	A10
Minnequa, Colo.	C10
New Britain, Conn.	S15
N. Tonawanda, N.Y.	B11
Pittsburg, Calif.	C11
Riverdale, Ill.	A7
San Francisco, Calif.	S7
Seattle, Wash.	B3
Sharon, Pa.	S3
Sterling, Ill.	W14
Torrance, Calif.	C11
Warren, O.	R2
Weirton, W. Va.	W6
Weirton, W. Va.	W8
Youngstown, O.	Y1

STRIP Hot Rolled Alloy

Bridgeport, Conn. (10c)	S15
Carnegie, Pa.	S15
Fontana, Calif.	K1
Gary, Ind.	U
Houston, Tex.	S4
Kansas City, Mo.	S8
Midland, Pa.	C18
New Britain, Conn. (10c)	S15
Sharon, Pa.	S3
Weirton, W. Va.	W6

STRIP Cold Rolled Carbon

Anderson, Ind. (10c)	G6
Bridgeport, Conn. (10c)	S15
Butler, Pa.	A10
Cleveland, O.	A7
Dearborn, Mich.	F3
Detroit, Mich.	D2
Detroit, Mich.	M1
Dover, O. (10c)	G6
Ecorse, Mich.	G5
Follansbee, W. Va.	F1
Fontana, Calif.	K1
Franklin Park, Ill. (10c)	T6
Harrison, N.J.	C15
Lackawanna, N.Y.	B2
Los Angeles, Calif.	C1
Mattapan, Mass.	T6
Middletown, O.	A10
New Britain, Conn.	S15
Riverdale, Ill.	A7
Sharon, Pa.	S3
Warren, O.	R2
Weirton, W. Va.	W6
Youngstown, O.	Y1

STRIP Cold Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beloit, Wis.		7.90	8.20	10.20	12.50
Bridgeport, Conn. (10c)	S15	7.60	8.20	10.20	12.50
Bristol, Conn.	W1		8.50	10.50	
Carnegie, Pa.	S15	7.60	8.20	10.20	12.50
Cleveland, O.	A7	7.50	8.20	10.20	12.50
Dearborn, Mich.	D2	8.05	7.90	8.50	
Detroit, Mich.	D2	8.45	7.90	8.50	
Dover, O.	G6	7.50	7.65	8.25	10.20
Franklin Park, Ill.	T6	8.45	7.45	8.05	10.35
Harrison, N.J.	C15			8.50	10.50
Mattapan, Mass.	T6	8.55	7.80	8.50	10.50
New Britain, Conn.	S15	7.80	7.65	8.25	10.20
New Castle, Pa.	B4	7.80	7.65	8.25	10.20
New Castle, Pa.	E3	7.80	7.65	8.25	10.20
New Haven, Conn.	D2	8.70	7.80	8.20	
New York, N.Y.			7.80	8.50	10.50
Pawtucket, R.I.	N5				
Cleveland-Pitts. Base			7.65	8.25	10.20
Worcester, Mass. Base		8.30	7.85	8.55	10.50
Sharon, Pa.	S3	7.80	7.65	8.25	10.20
Trenton, N.J.	R5		7.95	8.55	10.50
Wallingford, Conn.	W2	8.30	7.80	8.50	10.50
Warren, O.	R2	7.80	7.65	8.25	10.20
Weirton, W. Va.	W6	7.80	7.65	8.25	10.20
Worcester, Mass.	A7	8.40	7.90	8.60	10.60
Worcester, Mass.	T6	8.50	7.90	8.55	10.50
Youngstown, O.	S5		7.65	8.25	10.20

Spring Steel (Tempered)

Trenton, N.J.	R5	10.50	12.50
Harrison, N.J.	C15	10.50	12.50
New York, N.Y.		10.50	12.50
Youngstown, O.	S5	10.50	12.50

New Britain, Conn.	S15
N. Tonawanda, N.Y.	B11
Pittsburg, Calif.	C11
Riverdale, Ill.	A7
San Francisco, Calif.	S7
Seattle, Wash.	B3
Sharon, Pa.	S3
Sterling, Ill.	W14
Torrance, Calif.	C11
Warren, O.	R2
Weirton, W. Va.	W6
Weirton, W. Va.	W8
Youngstown, O.	Y1

STRIP Hot Rolled Alloy

Bridgeport, Conn. (10c)	S15
Carnegie, Pa.	S15
Fontana, Calif.	K1
Gary, Ind.	U
Houston, Tex.	S4
Kansas City, Mo.	S8
Midland, Pa.	C18
New Britain, Conn. (10c)	S15
Sharon, Pa.	S3
Weirton, W. Va.	W6

STRIP Cold Rolled Carbon

Anderson, Ind. (10c)	G6
Bridgeport, Conn. (10c)	S15
Butler, Pa.	A10
Cleveland, O.	A7
Dearborn, Mich.	F3
Detroit, Mich.	D2
Detroit, Mich.	M1
Dover, O. (10c)	G6
Ecorse, Mich.	G5
Follansbee, W. Va.	F1
Fontana, Calif.	K1
Franklin Park, Ill. (10c)	T6
Harrison, N.J.	C15
Lackawanna, N.Y.	B2
Los Angeles, Calif.	C1
Mattapan, Mass.	T6
Middletown, O.	A10
New Britain, Conn.	S15

STRIP Cold Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beloit, Wis.		7.90	8.20	10.20	12.50
Bridgeport, Conn. (10c)	S15	7.60	8.20	10.20	12.50
Bristol, Conn.	W1		8.50	10.50	
Carnegie, Pa.	S15	7.60	8.20	10.20	12.50
Cleveland, O.	A7	7.50	8.20	10.20	12.50
Dearborn, Mich.	D2	8.05	7.90	8.50	
Detroit, Mich.	D2	8.45	7.90	8.50	
Dover, O.	G6	7.50	7.65	8.25	10.20
Franklin Park, Ill.	T6	8.45	7.45	8.05	10.35
Harrison, N.J.	C15			8.50	10.50
Mattapan, Mass.	T6	8.55	7.80	8.50	10.50
New Britain, Conn.	S15	7.80	7.65	8.25	10.20
New Castle, Pa.	B4	7.80	7.65	8.25	10.20
New Castle, Pa.	E3	7.80	7.65	8.25	10.20
New Haven, Conn.	D2	8.70	7.80	8.20	
New York, N.Y.			7.80	8.50	10.50
Pawtucket, R.I.	N5				
Cleveland-Pitts. Base			7.65	8.25	10.20
Worcester, Mass. Base		8.30	7.85	8.55	10.50
Sharon, Pa.	S3	7.80	7.65	8.25	10.20
Trenton, N.J.	R5		7.95	8.55	10.50
Wallingford, Conn.	W2	8.30	7.80	8.50	10.50
Warren, O.	R2	7.80	7.65	8.25	10.20
Weirton, W. Va.	W6	7.80	7.65	8.25	10.20
Worcester, Mass.	A7	8.40	7.90	8.60	10.60
Worcester, Mass.	T6	8.50	7.90	8.55	10.50
Youngstown, O.	S5		7.65	8.25	10.20

Spring Steel (Tempered)

Trenton, N.J.	R5	10.50	12.50
Harrison, N.J.	C15	10.50	12.50
New York, N.Y.		10.50	12.50
Youngstown, O.	S5	10.50	12.50

STRIP Hot Rolled Ingot Iron

Ashland, Ky.	A10
Warren, O.	R2

STRIP Cold Rolled Ingot Iron

Warren, O.	R2

TIGHT COOPERAGE HOOP

Atlanta, Ga.	A11
Riverdale, Ill.	A1
Sharon, Pa.	S3
Youngstown, O.	Y1

STRIP Electro Galvanized

Dover, O.	G6
Warren, O.	T2
Weirton, W. Va.	W6
Youngstown, O.	S5

STRIP Cold Rolled Alloy Steel

Bridgeport, Conn. (10c)	S15
Carnegie, Pa.	S15
Cleveland, O.	A7
Dover, O.	G6
Fontana, Calif.	K1
Harrison, N.J.	C15
Midland, Pa.	C18
New Britain, Conn. (10c)	S15
Pawtucket, R.I. (1c)	N5
Pawtucket, R.I. (2c)	N5
Sharon, Pa.	S3
Worcester, Mass.	A7
Youngstown, O.	S5

STRIP Hot Rolled Ingot Iron

Ashland, Ky.	A10
Warren, O.	R2

STRIP Cold Rolled Ingot Iron

Warren, O.	R2

TIGHT COOPERAGE HOOP

Atlanta, Ga.	A11
Riverdale, Ill.	A1
Sharon, Pa.	S3
Youngstown, O.	Y1

STRIP Cold Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beloit, Wis.		7.90	8.20	10.20	12.50
Bridgeport, Conn. (10c)	S15	7.60	8.20	10.20	12.50
Bristol, Conn.	W1		8.50	10.50	
Carnegie, Pa.	S15	7.60	8.20	10.20	12.50
Cleveland, O.	A7	7.50	8.20	10.20	12.50
Dearborn, Mich.	D2	8.05	7.90	8.50	
Detroit, Mich.	D2	8.45	7.90	8.50	
Dover, O.	G6	7.50	7.65	8.25	10.20
Franklin Park, Ill.	T6	8.45	7.45	8.05	10.35
Harrison, N.J.	C15			8.50	10.50
Mattapan, Mass.	T6	8.55	7.80	8.50	10.50
New Britain, Conn.	S15	7.80	7.65	8.25	10.20
New Castle, Pa.	B4	7.80	7.65	8.25	10.20
New Castle, Pa.	E3	7.80	7.65	8.25	10.20
New Haven, Conn.	D2	8.70	7.80	8.20	
New York, N.Y.			7.80	8.50	10.50
Pawtucket, R.I.	N5				
Cleveland-Pitts. Base			7.65	8.25	10.20
Worcester, Mass. Base		8.30	7.85	8.55	10.50
Sharon, Pa.	S3	7.80	7.65	8.25	10.20
Trenton, N.J.	R5		7.95	8.55	10.50
Wallingford, Conn.	W2	8.30	7.80	8.50	10.50
Warren, O.	R2	7.80	7.65	8.25	10.20
Weirton, W. Va.	W6	7.80	7.65	8.25	10.20
Worcester, Mass.	A7	8.40	7.90	8.60	10.60
Worcester, Mass.	T6	8.50	7.90	8.55	10.50
Youngstown, O.	S5		7.65	8.25	10.20

Spring Steel (Tempered)

Trenton, N.J.	R5	10.50	12.50
Harrison, N.J.	C15	10.50	12.50
New York, N.Y.		10.50	12.50
Youngstown, O.	S5	10.50	12.50

* Plus $1.375 per 100 lb.

Key to Producers

A1 Acme Steel Co.	
A3 Alan Wood Steel Co.	
A4 Allegheny Ludlum Steel	
A7 American Steel & Wire	
A8 Anchor Drawn Steel Co.	
A9 Angel Nail & Chaplet	
A10 Armco Steel Corp.	
A11 Atlantic Steel Co.	
A14 American Chemetals Co.	
B1 Babcock & Wilcox Co.	
B2 Bethlehem Steel Co.	
B3 Beth. Pac. Coast Steel	
B4 Blair Strip Steel Co.	
B6 Boss & Laughlin, Inc.	
B7 Braeburn Alloy Steel	
B8 Brackenridge Steel	
B10 Buffalo Tank Steel	
B11 A. M. Byers Co.	
C1 Casalo Steel Corp.	
C2 Calumet Steel Div.	
	Borg Warner Corp.
C4 Carpenter Steel Co.	
C5 Cartaret Hook & Steel Div.	
	Raritan Steel Corp.
C7 Cleve. Cold Rolling Mills	
C8 Cold Metal Products Co.	
C9 Colonial Steel Co.	
C10 Colorado Fuel & Iron	
C11 Columbia-Geneva Steel	
C12 Columbia Steel & Shaft	
C13 Columbia Tool Steel Co.	
C14 Compressed Steel Shaft	
C16 Continental Steel Corp.	
C17 Copperweld Steel Co.	
C18 Crucible Steel Co.	
C19 Cumberland Steel Co.	
C20 Cuyahoga Steel & Wire	
C22 Claymont Steel Corp.	
D2 Detroit Steel Corp.	
D3 Detroit Tube & Steel	
D4 Do-All Saw & Knife	
D6 Drever Harris Co.	
D7 Jackson Weatherproof Nail Co.	
E1 Eastern Gas & Fuel Assn.	
E2 Eastern Stainless Steel	
E4 Electro Metallurgical Co.	
E5 Elliott Bros. Steel Co.	
E6 Empire Steel Corp.	
F2 Firth Sterling Inc.	
F3 Fitzsimons Steel Co.	
F4 Follansbee Steel Corp.	
F5 Franklin Steel Div.	
	Borg Warner Corp.
F6 Frantz Mfg. Co.	
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F185 Frantz Mfg. Co.	
F186 Frantz Mfg. Co.	
F187 Frantz Mfg. Co.	
F188 Frantz Mfg. Co.	
F189 Frantz Mfg. Co.	
F190 Frantz Mfg. Co.	
F191 Frantz Mfg. Co.	
F192 Frantz Mfg. Co.	
F193 Frantz Mfg. Co.	
F194 Frantz Mfg. Co.	
F195 Frantz Mfg. Co.	
F196 Frantz Mfg. Co.	
F197 Frantz Mfg. Co.	
F198 Frantz Mfg. Co.	
F199 Frantz Mfg. Co.	
F200 Frantz Mfg. Co.	
F201 Frantz Mfg. Co.	
F202 Frantz Mfg. Co.	
F203 Frantz Mfg. Co.	
F204 Frantz Mfg. Co.	
F205 Frantz Mfg. Co.	
F206 Frantz Mfg. Co.	
F207 Frantz Mfg. Co.	
F208 Frantz Mfg. Co.	
F209 Frantz Mfg. Co.	
F210 Frantz Mfg. Co.	
F211 Frantz Mfg. Co.	
F212 Frantz Mfg. Co.	
F213 Frantz

WIRE, Merchant Quality

(6 to 8 gage)	Anld	Galv
Alabama City Ala B2	6.05	6.325
Aliquippa Pa	6.05	6.45
Atlanta A11	6.20	6.65
Bartonsville Ill Ky K4	6.05	6.40
Buffalo W12	6.25	
Cleveland A7	6.05	6.225
Crawfordsville Ind Ms	6.15	6.50
Donora Pa A4	6.05	6.225
Duluth Minn A7	6.05	6.225
Fairfield T2	6.05	6.225
Houston Tex S6	6.40	6.625
Johnstown B2	6.05	6.4
Joliet Ill A7	6.05	6.225
Kansas City Mo S6	6.05	6.825
Kokomo C16	6.15	6.425
Los Angeles B3	7.05	7.425
Minnequa Colo C10	6.05	6.45
Monessen Pa P7	6.05	6.225
Palmer Mass W12	6.15	6.45
Pittsburg Calif C11	7.05	7.425
Portsmouth O P12	6.05	6.225
Rankin Pa A7	6.05	6.225
Sparrows Pt Md B2	6.05	6.225
Sterling Ill C11 N15	6.05	6.425
Struthers O Y1	6.05	6.425
Torrance Calif C11	7.05	7.425
Worcester A7	6.25	6.625

(Based on 14-cent zinc. 14.50-cent zinc, extras.)

ROPE WIRE

Alton Ill I1	6.75
Bartonsville Ill K4	6.95
Buffalo W12	6.55
Fostoria O S1	6.85
Johnstown Pa B2	6.55
Monessen Pa P7	6.55
Monessen Pa P7	6.55
Moline Ill I7	6.75
Palmer Mass W12	6.55
Portsmouth O P12	6.55
Sparrows Pt Md B2	6.55
Struthers O Y1	6.55
Worcester A7	6.55

(Based on 14-cent zinc. 14.50-cent zinc. Includes 4.75-cent Clo. Plow and Mold Plow advance. Add 0.25 for improved plow.)

WIRE, Manufacturers Bright Low Carbon

Alabama City Ala B2	6.225
Aliquippa Pa Ja 42	6.35
Atlanta A11	6.45
Alton Ill I1	6.45
Bartonsville Ill K4	6.325
Buffalo W12	6.225
Chicago W11	6.475
Cleveland A7 C26	6.225
Crawfordsville Ind M5	6.325
Donora Pa A7	6.225
Duluth Minn A7	6.225
Fairfield Ala T2	6.225
Fostoria O S24 S1	6.325
Houston S6	6.625
Johnstown Pa B2	6.225
Joliet Ill A7	6.225
Kansas City Mo S6	6.825
Kokomo Ind C16	6.325
Los Angeles B3	6.475
Minnequa Colo C10	6.475
Monessen Pa P7	6.475
New Haven Conn A7	6.55
No Tonawanda N Y B11	6.225
Palmer Mass W12	6.325
Pittsburg Calif C11	6.475
Portsmouth O P12	6.225
Rankin Pa A7	6.225
Sparrows Pt Md B2	6.225
So San Francisco C10	6.475
Sparrows Pt Md B2	6.325
Sterling Ill N15	6.225
Struthers O Y1	6.225
Torrance Calif C11	6.425
Waukegan Ill A7	6.225
Worcester A7	6.225
Worcester Mass W12	6.225
Worcester Mass J4	6.375

WIRE, Tire Bead

Bartonsville Ill K4	11.50
Monessen Pa P16	11.40
Roebling N J R5	11.55

WIRE, Fine & Weaving (8 Coils)

Bartonsville Ill K4	9.42
Buffalo W12	8.90
Chicago W11	9.32
Cleveland A7	8.90
Crawfordsville Ind M5	8.90
Fostoria O S1	8.90
Johnstown Pa B2	8.90
Kokomo Ind C16	8.90
Monessen Pa P16	8.90
Muncie Ind I7	9.10
Palmer Mass W12	9.20
Roebling N J R5	9.20
Waukegan Ill A7	8.90
Worcest Mass A7 J4	9.20

WIRE, Barbed

	Col
Alabama City Ala B2	144
Aliquippa Pa J5	145
Atlanta A11	146
Bartonsville Ill Ky K4	146
Crawfordsville Ind M5	146
Donora Pa A7	142
Duluth Minn A7	142
Fairfield Ala T2	142
Houston Tex S6	146
Johnstown Pa B2	142
Kansas City Mo S6	146
Kokomo Ind C16	146
Minnequa Colo C10	1337
Monessen Pa P7	147
Pittsburg Calif C11	142
Rankin Pa A7	142
So San Fran Calif C10	1677
Sparrows Point Md B2	149
Sterling Ill N15	146

(Based on 14-cent zinc.)

WIRE, Upholstery Spring

Aliquippa Pa J5	6.275
Alton Ill I1	6.65
Buffalo W12	6.275
Cleveland A7	6.275
Donora Pa A7	6.275
Duluth Minn A7	6.275
Johnstown Pa B2	6.275
Los Angeles B3	7.225
Minnequa Colo C10	7.225
Monessen Pa P7	6.275
New Haven Conn A7	6.575
Palmer Mass W12	6.375
Pittsburg Calif C11	7.225
Portsmouth O P12	6.275
Roebling N J R5	6.375
So Chicago Ill B2	6.275
So San Francisco C10	7.225
Sparrows Point Md B2	6.375
Torrance Calif C11	7.225
Trenton N J A7	6.375
Waukegan Ill A7	6.275
Worcester Mass A7	6.575

WOVEN FENCE (9-15½ Ga.)

	Col
Alabama City Ala B2	133
Ala City Ala Ex Ingo B2	252
Aliquippa Pa 9-14½ ga J5	141
Atlanta A11	140
Bartonsville Ill Ky K4	137
Crawfordsville Ind M5	140
Donora Pa A7	133
Duluth Minn A7	133
Fairfield Ala T2	133
Houston Tex S6	141
Johnstown Pa B2	133
Johnstown Ex 6' B2	229
Joliet Ill A7	133
Kansas City Mo S6	141
Kokomo Ind C16	140
Minnequa Colo C10	1467
Monessen Pa P16	135
Pittsburg Calif C11	136
Rankin Pa A7	133
So Chicago Ill B2	135
Sterling Ill N15	132

*Based on 14-cent zinc.

BALE TIES, Single Loop

	Col
Alabama City Ala B2	132
Atlanta A11	131
Bartonsville Ill Ky K4	132
Crawfordsville Ind M5	131
Donora Pa A7	131
Duluth Minn A7	131
Fairfield Ala T2	131
Kansas City Mo S6	131
Kokomo Ind C16	131
Minnequa Colo C10	131
Pittsburg Calif C11	131
So Chicago Ill B2	131
So San Fran Calif C10	131
Sparrows Point Md B2	131
Sterling Ill C11 N15	131
Torrance Calif C11	131
Worcester Mass A7	131

FENCE POSTS

Chicago Hts Ill C2	140
Duluth Minn A7	142
Franklin Pa F5	140
Hartford & W Va W4	147
Johnstown Pa B2	142
Marion O C11	140
Minnequa Colo C10	140
Moline Ill I2	1337
So Chicago Ill B2	147
Tonawanda N Y B12	142
Williamsport Pa S19	142

TRACK BOLTS (20) Treated

Kansas City Mo S6	6.85
Lebanon Pa C11 B2	6.85
Minnequa Colo C10	6.85
Pittsburgh O P14	6.85

AXLES

Ind Harbor Ind S13	5.65
Johnstown Pa B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col
Alabama City Ala B2	114
Aliquippa Pa J5	115
Atlanta A11	116
Bartonsville Ill Ky K4	127
Chicago Ill W11	115
Cleveland A7	125
Crawfordsville Ind M5	130
Donora Pa A7	114
Duluth Minn A7	114
Fairfield Ala T2	114
Galveston Tex D7	114
Houston Tex S6	114
Johnstown Pa B2	114
Joliet Ill A7	114
Kansas City Mo S6	114
Kokomo Ind C16	129
Minnequa Colo C10	123
Monessen Pa P7	127
Pittsburg Calif C11	117

RAILS

	Std No. 1	Std No. 2	Std All No. 2	Tee Rails 60 lb Under
Bessemer Pa U5	3.775	3.675	3.725	4.25
Ensley Ala T2	3.775	3.675		4.25
Fairfield Ala T2				4.25
Gary Ind U5	3.775	3.675	3.725	
Huntington W Va W7				4.25
Indiana Harbor Ind I2	3.775	3.675	3.725	
Johnstown Pa B2				4.25
Lackawanna N Y B2	3.775	3.675		4.25
Minnequa Colo C10	$75.00	$73.00		4.75
Steelton Pa B2	3.775	3.675		4.25
Williamsport Pa S19				5.00

*Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
Non-Deforming	0.550
Air Hardening	0.675

Grade by Analysis

W	Cr	V	Co	
18	4	1		1.505
18	4	2	1.65	1.86
20	4	2	1.65	1.86
20	4	2	12	3.715
18	4	2	5	2.465
18	4	2	8	2.125
18	4	2	12	2.125
6	4	2	5	2.445
6	4	2	8	2.445
15	4	3		1.605
1	1.25	0.5		1.01

W	Cr	V	Mo	
6	4	1.5	2	0.965
5	4	1	1	1.00
1.5	4	1	8.5	0.810

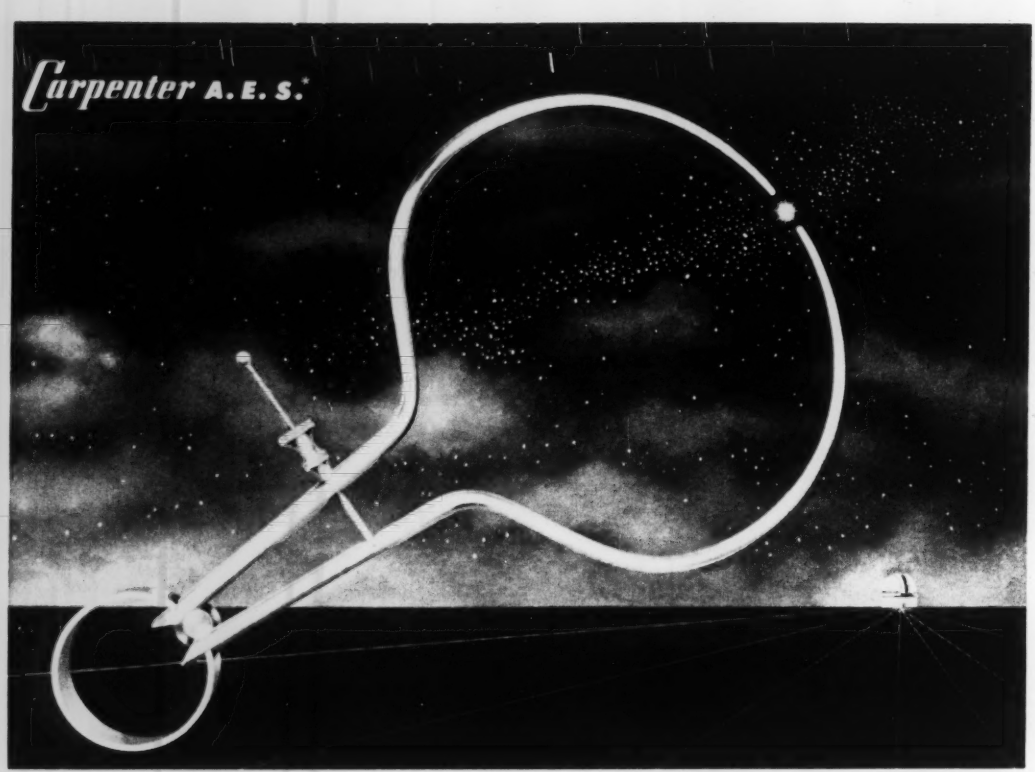
Tool steel producers include: A1 A6 B2 B5 C4 C9 C11 C18 D4 F2 J1 L3 M13 S8 T1 V1

Footnotes

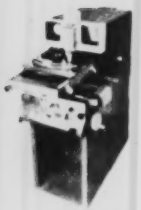
(a) Chicago base.
(b) Add 5 days batch.
(c) Merchant.
(d) Reinforcing.
(e) Cleveland or Buffalo base.
(f) To dealers, cut lengths.
(g) To jobbers, lots of 1 car and heavier.
(h) To jobbers, lots of 1 car and heavier.
(i) Pittsburgh base.
(j) Cleveland & Pitts. base.
(k) Worcester, Mass. base.
(l) Add 0.05c for 17 Ga. & heavier.
(m) Nails and fittings.
(n) Delivered jobber.
(o) Flats only.
(p) To dealers.
(q) Chicago & Pitts. base.
(r) 2% off for unlisted.
(s) New Haven Conn. base.
(t) Del. San Francisco Bay area.
(u) 2% 30 days, net 31st.
(v) Delivery 2% 31st-45th day.
(w) Bar mill basis.
(x) Reinforcing mill.
(y) Subject to fabricators' to consumers.
(z) Bar mill size.
(aa) Reinforcing bars.
(ab) Add $1.00 per ton to universal mill.
(ac) Not applicable.
(ad) Rd. or square edge.
(ae) To jobbers, Indust. 2%.
(af) 2" and narrower.
(ag) 3" and narrower.
(ah) Add 0.05c for 17 ga. & lighter.
(ai) 4" and narrower.
(aj) Add 0.05c for 17 ga. & lighter.
(ak) 6" and narrower.
(al) Indust. plan 2%.
(am) Jobbers, 2% 30 days.
(an) Delivered.
(ao) Base, 1 to 5 tons.
(ap) Add 0.05c for base and 17 ga. & lighter.
(aq) Add 0.05c for 17 ga. & lighter.
(ar) Add 0.05c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid States Steel & Wire
M9 Midvale Co.
M12 Montrose Steel Products
M13 Monarch Steel Co.
M14 Holmes Steel Co.
N2 National Supply Co.
N3 National Tube Div.
N4 National Steel & Wire Co.
N6 New Era Cut Nail Co.
N9 Newport Rolling Mill Div.
N10 Newman Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll Mills
N15 Northwestern S&W Co.
N16 New Jersey Zinc Co.
O2 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Crucible Steel
P7 Pittsburgh Steel Co.
P8 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Potts-Stowe & Rail Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R4 Roebling & Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Elec. Eng. Mfg.
S1 Seneca Wire & Mfg. Co.
S2 Sharon Steel Corp.
S3 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sivyer Steel & S&I Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Strutters Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip, Division Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Steel & Tube



Finding a Faster Way to Measure a Star



Another example of how Carpenter "Application Engineering Service is working for industry

The giant 200-inch telescope at California's Mt. Palomar Observatory was picking up thousands of stars missed by other telescopes. But the job of measuring and coordinating the data revealed by the photographs was so big that astronomers couldn't keep abreast of it. Then the delicate astrophotometer was developed and the problem was solved. The new device *mechanically* computes the size of a star in a fraction of the time trained astronomers could do it with former devices.

Naturally, such a precise instrument posed quite a few materials problems. One was the type of steel for the hardened ways on which the machine travels horizontally back and forth. Many different special steels were tried. All failed because they couldn't meet the exacting straightness that was required.

Then, Carpenter **A**pplication **E**ngineering **S**ervice was called in . . . and Carpenter Vega, a new air-hardening steel that shows practically no distortion in heat treatment was put to work. Used successfully for thousands of critical tool and die applications, Vega has proved to be the only steel found to stay straight enough in the 20" lengths of the ways. Are there applications in *your* plant where a steel providing this kind of performance could give your product extra competitive advantages?

Time and again, industry is finding new ways to save money and improve the salability of products with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service that uses *imagination* to apply steels for best results. A.E.S. is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
List Per Ft	8.5c	11.5c	17c	23c	27.5c	37c	58.5c	76.5c
Pounds Per Ft	0.85	1.13	1.68	2.28	2.73	3.68	5.82	7.62

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Alton, Ill. L1	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (c)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Fontana, Calif. K1 (c)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25
Ind. Harbor, Ind. Y1 (c)	31.5	12.25	34.5	16.25	37	19.75	37.5	19.5	38	20.5	38.5	21	39	20.75	39	20.75
Lorain, O. N3 (c)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Pittsburgh J5	30.75		33.75		36.25		36.75		37.25		37.75		41.5		41.5	
Sharon, Pa. M6 (c)	32.5	12.25	35.5	16.25	38	19.25	38.5	19	39	19.5	39.5	20	40	19.75	40	19.75
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (c)	32.5	14.25	35.5	18.25	38	21.75	38.5	21.25	39	21.25	39.5	22.75	40	22.25	40	22.25
Youngstown Y1 (c)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size-Inches	⅜	½	¾	1	1¼	1½	2	2½	3	4	5	6
List Per Ft	37c	58.5c	76.5c	92c	$1.09	$1.48	$1.92
Pounds Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15		
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15		
Lorain, O. N3 (c)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15		
Youngstown Y1	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15		

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown R2	24	6.75	27	8.75	27	8.75	29	10.75	29	10.75	33.75	15.5	33.75	15.5		

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	4
List Per Ft	5.5c	6c	9c	9.2c	$1.09
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28	2.72	3.65	10.89

	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	0.25	23.25	3.5	17.75	7.75	33	14.25	33	14.25						
Butler, Pa. F6 (c)	30.5	1.25	25	1.75	20	5.5										
Etna, Pa. N2	30.5	1.25	25	1.75	20	5.5	33	14.25	33	14.25						
Sharon, Pa. M6 (c)	29.5	0.25	23	3.5	18	8.25										
Sparrows Pt., Md. B2	28.5	0.75	23	3.75	18	7.50										
Youngstown R2 (c)							33	14.75	33	14.75						
Wheatland, Pa. W9	28.5	0.75	23.5	3.75	18	7.50										

Galvanized pipe discounts based on zinc price of [illegible] 14c [illegible] 14.50c, [illegible] 14.50c.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding	Plates— Carbon Base 10%	20%	Sheets— Carbon Base 10%	20%	Copper Base Both Sides
302			19.75	26.24-27.50	77.00
304	25.00	29.30	24.50	27.50-27.75	77.00
309	30.50	35.00			
310	36.50	41.00			144.00
316	29.50	34.00	26.00	35.92-36.50	
317	34.50	39.00			
318	33.50	38.00			
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	23.25	27.75			
410	29.75	27.25			
Nickel	33.50	43.75			
Inconel	44.25	54.15			165.00
Monel	34.93	46.28			
Copper*			14.00		

	Strip — Carbon Base — Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Nickel	41.00	51.00		
Copper*	25.70	26.60	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheet: Coatesville, Pa., AS and New Castle, Ind. I-L; stainless-clad plates: Claymont, Del. C22, Coatesville, Pa. I-T and Washington, Pa. J1; nickel-clad plates: Coatesville, Pa. I-T; Inconel, copper-clad strip: Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

	Reg. Hvy.
6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in.	12	6.5
⅞-in.-1¼-in.	9	1
1⅜-in. & larger	7.5	1
H.P. Hex:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1¼-in.	12	2
1⅜-in. & larger	8.5	2
C.P. Hex:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1⅛-in.	19.5	12
1¼-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

	Reg.	Hvy.
(Per cent off list for less than case or keg quantities)		
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1⅛-in.	24	15
1¼-in. & larger	13	8.5
		Light
¼-in. & smaller	35	35
⅜-in. to ⅝-in.	28.5	26
¾-in. to 1½-in.	24	16

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	16.50-17.50
New River foundry	20.80
Wise county foundry	15.95
Wise county furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass. ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Detroit, del.	27.05
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati, del.	25.23
Lonestar, Tex., ovens	18.50
Philadelphia, ovens	22.50
Neville Island, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.58
Flint, del.	26.73
Pontiac, del.	25.56
Saginaw, del.	27.08

*Or within $1.55 freight zone from works.

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85c
⅝-in. under	36 off

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 and 430 sheets, except 303 and 309 B2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip, except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 45.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Marshall, Pa., bars U5.

Muncie, Ind., wire 1-7 quotes Types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

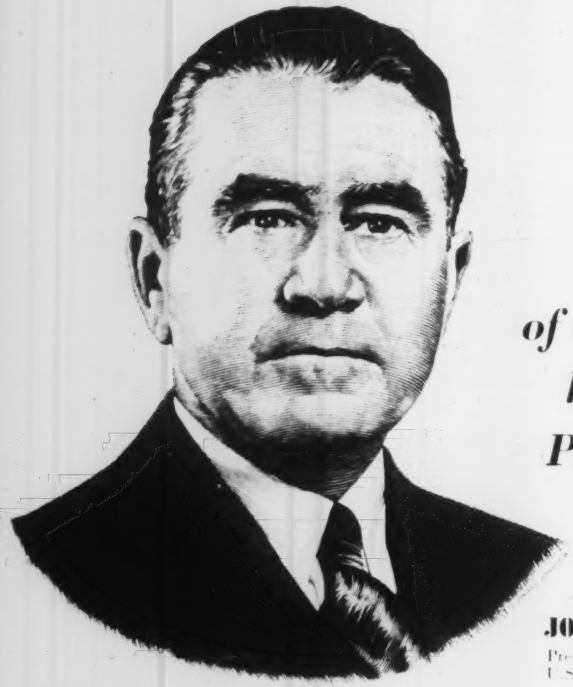
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh except as otherwise noted)

Sponge iron	Cents 98+% Fe, annealed 18.00
Unannealed	14.50
Swedish, c.i.f. New York, in bags	8.85-9.90
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel, unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metals)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh, 1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum, 99.9% minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min	3.50



"More than 98% of our 27,000 employees have enrolled in the Payroll Savings Plan"

JOHN E. GOBLE
President, National Tube Division,
U. S. Steel Corporation

"We of the National Tube Division of the United States Steel, recognize that systematic saving through the Payroll Deduction Plan is an investment in the security of the Nation, as well as of the individual. We are proud of the participation resulting from a person-to-person canvass in our plants and offices. More than 98% of our 27,000 employees have enrolled in the Payroll Savings Plan—a complete affirmation of their faith in America. Such personal savings are the backbone of our free enterprise system."

Concisely, clearly, Mr. Goble cites three of the reasons why 98% of the 27,000 employees of National Tube are enrolled in the Payroll Savings Plan:

- recognition by management that the Payroll Savings Plan contributes "to the security of the Nation as well as of the individual."
- the purchase of Defense Bonds through payroll deductions is concrete affirmation of Americans' faith in America.
- a person-to-person canvass in plants and offices put a Payroll Savings application in the hands of every National Tube employee.

There is still another reason for National Tube's outstanding employee participation: *Mr. Goble's personal interest in the Payroll Savings Plan, and the conducting of the person-to-person canvass.*

State Directors of the Treasury Department, members of the Field Staff of the Payroll Savings Division, Volunteer Chairmen of industry groups—everyone associated with the Payroll Savings Plan—will tell you that every highly successful Payroll Plan is a reflection of the deep interest and personal effort of the company's top executive.

If you are the man who makes the top decisions in your company, ask today for a report of *your* Payroll Savings Plan, particularly, the percentage of participation. Then, call a meeting of your associates. Show them this statement of Mr. Goble's. Tell them you are going "all out" to put your company (large or small) in the front rank of those who can be justly proud of their Payroll Savings Plan.

A phone call, wire or letter to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D.C., will bring prompt cooperation from your State Director.

If you are not the chief executive of your company, please tear out this page and send it to the "Big Boss" with your recommendation.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

STEEL
The Weekly Magazine of Metalworking

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. & Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††		Carbon	Floor
New York (city)	6.96	7.57	8.27	6.86	...	6.59	7.83	11.34	6.69	6.90	8.31
Jersey City (city)	6.55	7.27	8.47	6.75	...	6.59	7.53	9.34	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.74	6.75	...	6.62	7.69	10.80	6.76	6.93	8.18
Boston (c-l-y)	6.51	7.36	8.54	6.55	...	6.42	7.49	10.60	6.56	6.73	7.98
Phila. (city)	6.36	7.38	8.60	6.70	8.55	6.67	7.70	11.04	6.42	6.49	7.62
Phila. (c-l-y)	6.21	7.13	8.35	6.45	8.30	6.42	7.45	10.70	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.62	6.62	...	6.61	7.62	11.37	6.67	6.67	7.90
Balt. (c-l-y)	5.81	7.17	8.42	6.42	...	6.41	7.42	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.50	7.58	...	6.58	6.68	7.80
Wash. (w'hse.)	6.31	7.61	8.90	6.89	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.66	6.41	...	6.40	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse.)	5.80	6.65	8.46	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse.)	5.80	6.65	8.05	5.94	...	5.93	6.90	10.64	5.95	5.95	7.18
Detroit (w'hse.)	6.07	6.92	8.34	6.13	7.70-8.03	6.30	7.10	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.39	6.20	...	6.09	7.11	10.99	6.48	6.32	7.71
Cleve. (w'hse.)	5.80	6.65	8.19	6.00	...	5.89	6.91	10.79	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.67	6.36	...	6.28	7.31	11.22	6.37	6.62	7.75
Chicago (city)	6.00	6.85	8.25	6.03	...	6.03	7.00	10.85	6.15	6.10	7.38
Chicago (w'hse.)	5.80	6.65	8.05	5.83	...	5.85	6.80	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.22	6.20	...	6.20	7.27	11.02	6.32	6.32	7.55
Milwau. (c-l-y)	5.97	6.82	7.02	6.00	...	6.00	7.07	11.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.15	8.55	6.34	...	6.33	7.40‡	11.15	6.50	6.50	7.78
St. L. (w'hse.)	6.10	6.95	8.35	6.14	...	6.13	7.20	10.95	6.35	6.35	7.58
Birmingham (city)	5.95	6.80	7.85‡	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birmingham (w'hse.)	5.80	6.65	7.70‡	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	10.00	6.94	11.40	6.80	8.81‡	12.25	6.80	6.80	9.67
L. A. (w'hse.)	6.60	8.45	9.80	6.74	11.20	6.60	8.61‡	12.05	6.60	6.66	9.47
Seattle-Tacoma	7.46	8.46	9.60	7.20	...	7.22	9.62‡	10.50‡	6.81	7.19	9.07
San Fran. (w'hse.)	6.80	8.22	9.70	6.79	...	6.70	8.62‡	11.85‡	6.70	6.85	9.20

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded), and Los Angeles (gage extra excluded). ‡ Includes 25-cent special bar quality extra. § As rolled. ¶ As annealed. Base quantities: 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ¤—500 to 1499 lb; ¤¤—450 to 1499 lb; ¤¤¤—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Eastern Local Ore

Cents per unit, del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports.

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid.

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 25:1 lump	nom.

Rhodesian

45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237, gross ton lots packed $252, less gross ton lots packed $269, f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, or Marietta, O. Base price $227, Johnstown, Pa.; $225, Sheridan, Pa., Lynchburg, Va.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.5c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices. Ic for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 7.5% C—max. 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 85-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 30c; 2000 to 39,999 lb, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 11.4c per lb of alloy, carload packed 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, Add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max; ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40% Ca 9-11%, Al 6.8% Zr 3.5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed 2" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy, ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy, ton lots 16.50c, less ton lots 17.75c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload bulk 14.50c, packed 15.50c, ton lots, packed 15.75c; less ton lots, packed 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Note: For current prices on chromium, silicon, vanadium, boron and tungsten alloys see page 223, Sept. 22 issue; calcium, zirconium, briquetted alloys and refractories, page 353, Oct. 13 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Oct. 16	$43.00
Oct. 9	43.00
Sept., 1952	43.00
Oct., 1951	43.60
Oct., 1947	39.85

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling to the and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	41.00	43.00
Midland, Pa.	44.00	46.00
Minneapolis, Minn.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	$1.00
4 No. 2 Heavy Melting	1.00
5 No. 2 Bundles	1.00
6 Machine Shop Turnings	10.00
7 Mixed Borings and Short Turnings	6.00
8 Shoveling Turnings	6.00
9 No. 2 Bushelling	4.00
10 Cast Iron Borings	6.00

Elec. Furnace and Idry. Grades

11 Billet, Bloom, & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structural & Plate	
16 3 feet and under	+ 2.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Bushelled Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Alloy Free Turnings	3.00
24 Heavy Turnings	1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	+ 3.00
27 No. 2 Chemical Borings	+ 4.00
28 Wrought Iron	+ 10.00
29 Shafting	+ 10.00
41 Old Tin & Terne Plated Bundles	10.00

Unprepared Grades

When compressed constitutes

32 No. 1 Bundles	6.00
33 No. 2 Bundles	9.00
34 Other than material suitable for hydraulic compression	8.00

Restrictions on Use

(1): Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2): Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3): Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4): Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces of foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5): Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and Hoop Axles with keyways between the wheelseats	Base
5 No. 1 Bushelling	3.50
6 No. 1 Turnings	3.00
7 No. 2 Turnings, Drillings & Borings	12.00
8 No. 2 Cast Steel and uncut wheelcenters	6.00
9 Uncut Rings, Switches	Base
10 Flues, Tubes & Pipes	+ 8.00
11 Structural Wrought Iron and steel, uncut	6.00
12 Non-rated Steel Cars	8.00
13 No. 1 Sheet Scrap	9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Relaying Rails	+ 7.00
Cut Rails	
16 2 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 3.00
20 Uncut Tires	+ 2.00
21 Cut Tires	+ 5.00
Bolsters & Side Frames	
22 Uncut	Base
23 Cut	+ 3.00
24 Axles, Spliced Bars & Tie Plates	+ 5.00
25 Solid Steel Axles	+ 12.00
26 Steel Wheels, No. 3	Base
27 Steel Wheels, No. 2	+ 5.00
28 Shafting Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Forgeboxes	8.00
32 Rollers	6.00
33 No. 2 Sheet Scrap	13.00
4 Grinder Dusts, Car Ends at Yard	6.00
35 Unassorted Iron & Steel	6.00
36 Unprepared scrap, not suitable for hydraulic compression	8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1): For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2): For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3): For crushing Grade No. 6, $3. For preparing into:

(4): Grade No. 25, $6.

(5): Grade No. 19, $6.

(6): Grades No. 12, No. 13, No. 14, No. 16 or No. 26, $10.

(7): Grade No. 17 or No. 21, $11.

(8): Grade No. 18, $12.

(9): For hydraulically compressing Grade No. 15, $8.

(10): For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1): For preparing into Grade No. 1 and Grade No. 2, $8.

(2): For hydraulically compressing Grade No. 13, $6. For preparing into:

(3): Grade No. 16, $4.

(4): Grade No. 17, $5.

(5): Grade No. 18, $7.

(6): Grade No. 21, $4.

(7): Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1): For preparing Grade No. 8 into Grade No. 7, $9.

(2): For preparing Grade No. 3 into Grade No. 11, $7.

(3): For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1 No. 1 (Cupola)	$49.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	49.00
10 Malleable	55.00
11 Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham

(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston

(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago

(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings, turnings	33.00-37.50
Shoveling turnings	37.50
Cast iron borings	35.00-37.50
No. 1 cupola cast	47.00-49.00
Charging box cast	43.00-45.00
Heavy breakable	43.00-44.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	44.00-46.00
Clean auto cast	50.00-52.00
Unstripped motor blocks	37.00-39.00
Malleable	50.00-52.00
Drop broken machinery	50.00-52.00

Cleveland

(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00

Detroit

(F.o.b. shipping point)

No. 1 cupola cast	49.00†
Heavy breakable	45.00†
Clean auto cast	52.00†
Unstripped motor blocks	43.00†
Drop broken machinery	52.00†
Charging box cast	47.00†

†Nominal.

Los Angeles

(Delivered)

No. 2 bundles	29.00
No. 1 cupola cast	49.00

New York

(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed boring, turnings	29.99
Machine shop turnings	25.99
Cupola cast	42.00-43.00
Unstripped motor blocks	36.00-37.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 bushelling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	48.00-50.00††
Unstripped motor blocks	42.00†
Heavy breakable	45.00†
Machinery cast	52.00†
Charging box cast	47.00†

†Ceiling price. ‡Nominal.
§Shipping point. ††Delivered.

Pittsburgh

(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Mixed borings, turnings	39.00†
Shovel turnings	48.50
No. 1 cupola cast	45.00
Heavy breakable	45.00

†Ceiling price.

San Francisco

(Delivered)

No. 2 heavy melting	31.00
Machine shop turnings	17.00
No. 2 bundles	29.00
No. 1 cupola cast	43.00

Seattle

(F.o.b. shipping point)

No. 1 cupola cast	44.00
Heavy breakable	40.00
Unstripped motor blocks	33.00

St. Louis

(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	38.00

Youngstown

(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Bushelling	36.00
Bushelling new factory	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

*F.o.b. shipping point.

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LOGEMANN Scrap Presses

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Where space is limited, plants and mills can conserve floor space and piping, and at the same time handle high tonnages at low operating cost with a Logemann Scrap Press.

Both two and three ram models are available with automatic controls and are recommended when the nature of the scrap warrants such application and where high output is desired.

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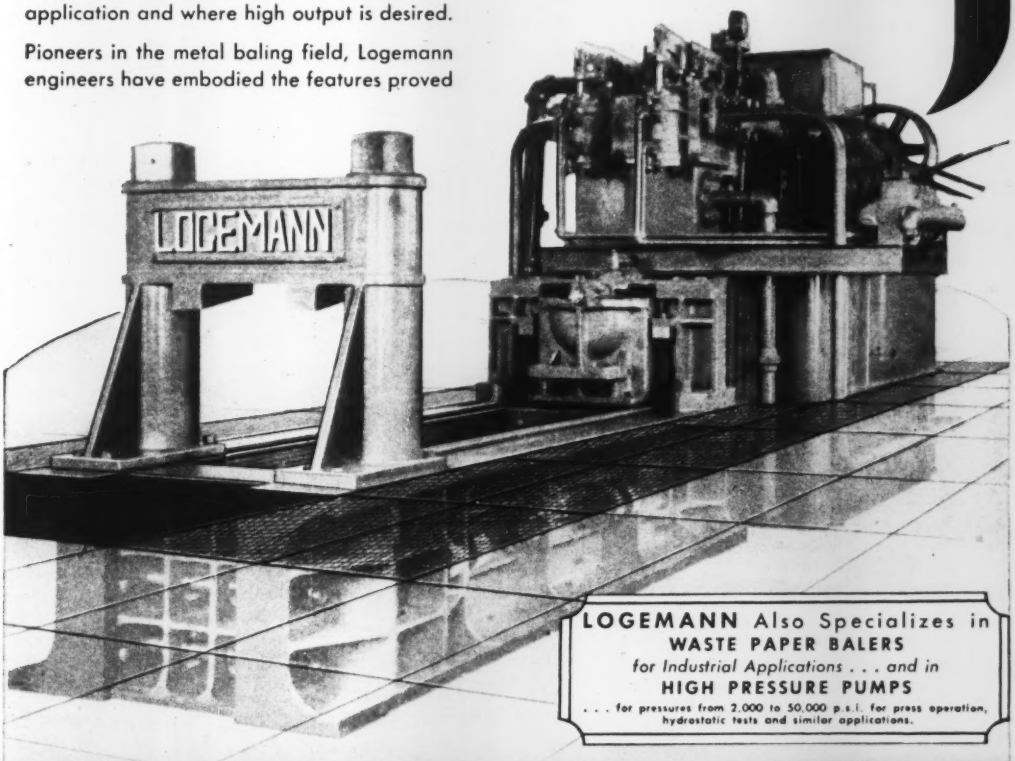

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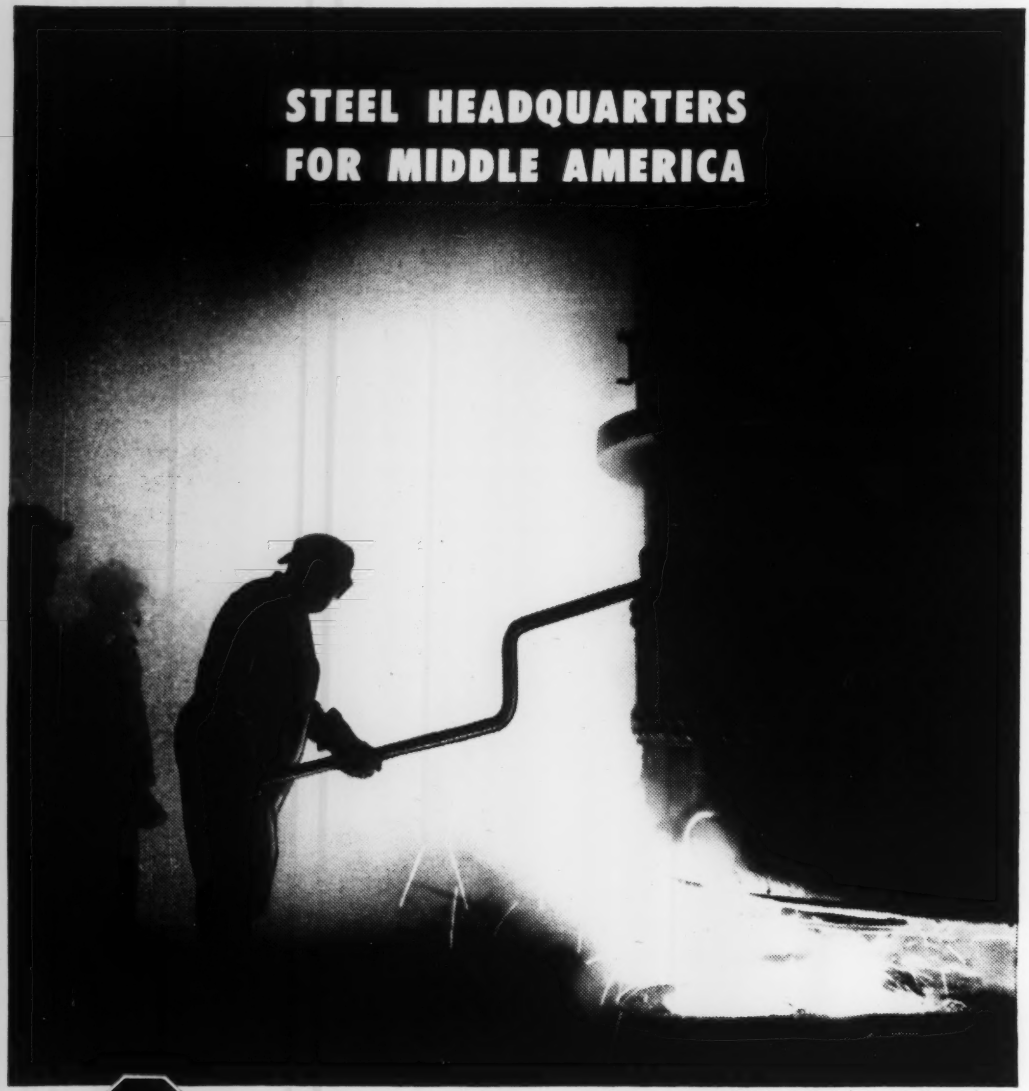

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Middle America, backbone of the nation, gets part of its strength from Granite City Steel's modern mills. Since 1878, Granite City Steel has been the main supplier of quality steel for Middle America. And today we continue to keep pace with Progress . . . continue to be Steel Headquarters for Middle America.

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Kansas City, Missouri
Memphis, Tennessee
Minneapolis, Minnesota
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- **GRANITE CITY STEEL COMPANY,** Granite City, Illinois

The Metal Market

Bauxite Plant Completed in West Africa

In distant French West Africa, one of the world's most modern bauxite mining, beneficiating and drying plants is completed on the island of Kassa, off the coast of French Guinea. Aluminum Co. of Canada Ltd. owns the plant shown here through its French subsidiary, Bauxites du Midi. First shipments of ore are now enroute to smelters in Canada and exports of 300,000 tons are planned in 1953

You have to look beyond actions of metal users to get true picture of supply. "Herd psychology" amplifies scarcities and surpluses

SOMEWHERE between the extremes of super-scarcity and superabundance manifested by nonferrous metals today lies their true supply position. Conditions aren't as one-sided as mass action or "herd psychology" of consumers makes them appear. The basic kaleidoscope is formed by changing military needs and attendant shifts in metal requirements, mining and refining conditions, labor and price developments, plus the so-called "ordeal by controls." It's the actions of metal users, though, that bring the pattern into bold relief.

Follow the Leader In hard-to-get metals like aluminum and copper, fabricators know deliveries are tough, so may magnify their needs in hopes of getting a fraction of them, or about what they originally wanted.

For such free and easy metals as zinc and lead that are playing a sort of price leapfrog in reverse, buyers hold orders in abeyance until the dust settles. They want only their minimum current needs even after inventories are depleted. Thus prevailing conditions can be distorted by consumers themselves.

Body Blow Aluminum isn't as badly off as some headlines would have you believe, but it's admittedly not as good as was anticipated even six months ago. Talk of "control for control's sake" is a bit premature, though aluminum refining made greatest expansion progress in third-quarter facilities programs. Some 45 per cent of the aluminum refining program given fast amortization was completed on Oct. 1.

Current production is taking a shellacking from nature though. NPA estimates daily losses at 550 tons. Kaiser takes the brunt of the Pacific Coast losses, with Alcoa and Reynolds also sharing cutbacks. Unless heavy rains come to the Northwest before the annual freeze, the power shortage could persist until March instead of December as now predicted. In the Southeast, Alcoa feels TVA power restrictions severely at Badin. Reynolds must scurry to keep its Listerhill, Ala., reduction plant in power, but has suffered no shutdowns to date.

Copper Calculations More tickets than copper have appeared in October, but NPA promises they'll be filled somehow. The "somehow" signifies smaller November allotments, about 50,000 tons of domestic and the same amount in foreign refined copper and concentrates. Since July the anticipated monthly supply of copper, estimated at 80,000 tons, has shrunk to about 72,000 tons actually available. Much of the loss comes in custom smelter output that's hampered by severe scrap shortages. Multiple price structure—you have half a dozen copper prices to choose from—causes losses of about 5000 tons monthly from domestic producers, according to NPA.

Lead Sinker The London Metal Exchange prices will henceforth rule the level of U. S. lead quotations to a large extent. Novelty of free trading after 13 years of inactivity seems undiminished as traders happily slash prices almost daily. Since the U. K. Ministry of Materials gave up its buyer-seller monopoly Oct. 1, lead has tumbled 5.5 cents a pound. Foreign lead can be bought on the East Coast at 12.75 cents, including duty and transportation.

Faced with this threat, U. S. producers in two-cent installments moved their prices more in line with the foreign quotations. Domestic lead now brings 14 cents a pound, New York, but the 1.25-cent spread still existing dulls buyers' appetite for the heavy metal. Full lead sheets and pipe are quoted at 19 cents a pound, lead traps and bends dropped two percentage points to list plus 43 per cent. Lead's weakness stems almost entirely from the London activity. Sales to domestic consumers in September were second-best in any month since December, 1950, though much of this was inventory replacement. Lead scrap is moving freely as dealers try to sell their way out from under the falling market. Smelting charge on battery plates, tip-off on volume, is moving up again.

Troubled Zinc Lead's traveling companion, zinc, feels the reverberations from the lead market. Even at 13.50 cents, nobody's buying much, except on the commodity exchange at 12 cents. Several smelters suspended operations last week because of the "depressed price."

Tin markets remain quiet and surprisingly firm, with futures trading at only fractional discounts from the RFC price of $1.215.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c Conn. Valley, Lake 24.62½c delivered.

Brass Ingots: 85-5-5-5 (No. 115): 27.25c; 88-10-2 (No. 215): 40.00c; 80-10-10 (No. 305): 33.00c; No. 1 yellow (No. 405): 23.25c.

Zinc: Prime western 13.50c; brass special 13.75c; intermediate 14.00c; East St. Louis; high grade 14.50c delivered.

Lead: Common 13.50c; chemical 13.90c; corroding 14.00c; all f.o.b. refinery.

Primary Aluminum: 99% plus ingots 20.00c; pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades not in bars granulated or shot: Grade 1 18.50c, grade 2 18.00c, grade 3 18.40c, grade 4 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American (99.50% and over but not meeting specifications below 99.60%, 99.8% and over, arsenic 0.06% max., other impurities 0.1% max.) 24.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes 99.9%, base sizes at refinery, unpacked 56.50c; 25-lb pigs 59.15c; "XX" nickel shot 60.15c. F.o.b. nickel shot or ingots, for addition to cast iron 56.50c. Prices include import duty.

Mercury: Open market spot New York, $190-200 per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms $2.00 del; special or patented shapes $2.15.

Cobalt: 97.99% $2.40 per lb for 500-lb kegs; $2.42 per lb for 100-lb cases; $2.47 per lb under 100 lb.

Gold: U. S. Treasury $35 per ounce.

Silver: Open market, New York 83.2c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze 90% 43.15; 95% 44.35; red brass 80% 43.10; 85% 42.34; best quality 41.35; nickel silver, 10% 55.05; phosphor bronze grade A, 5% 64.71.

Rod: Copper, hot rolled 41.37; cold drawn 42.62; yellow brass free cutting 33.85; commercial bronze 90% 44.02; 95% 44.97; red brass 80% 42.79; 85% 42.01.

Seamless Tubing: Copper 45.56; yellow brass 43.15; commercial bronze 90% 47.01; red brass 80% 46.01.

Wire: Yellow brass 40.46; commercial bronze 95% 45.44; 90% 44.67; red brass 85% 43.39; 80% 42.63; best quality brass 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Base, soft, f.o.b. eastern mills, 100,000 lb lots 32.79¢, 30,000 lb lots 32.92¢ c.l., 33.42. Weatherproof, 100,000 lb 31.60, 30,000 lb 33.85 c.l., 34.35. Magnet wire, del. 15,000 lb or more 38.75 c.l., 39.50.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 28 and 38 mill finish, c.l.

Thickness Range Inches	Widths of Diameters, Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Circles
0.249-0.136	12-48	31.6		
0.135-0.096	12-48	32.1		
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	34.1	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.018	12-36	35.7	32.7	37.5
0.017-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round R317-T4	Hexagonal R-317-T4	178-T4
0.125	54.6		
0.156-0.0188	46.2		
0.219-0.313	43.6		
0.375	42.0	48.3	50.4
0.406	42.0		
0.438	42.0	48.3	50.4
0.469	42.0		
0.500	42.0	48.3	50.4
0.531	42.0		
0.563	42.0		47.3
0.594	42.0		
0.625	42.0	45.7	47.3
0.688	42.0		47.3
0.750-1.000	41.0	43.1	44.6
			43.1
1.125-1.500	39.4	41.5	43.1
1.563	38.9		
1.625	38.3		41.5
1.688-2.000	38.3		

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 144 sq ft or more, per 100 lb 22.00c; cut sheets, per 100 sq ft (10 lb up) 2.20c. Pipe: Full rolls, $19.00 per cwt. Traps and bend, 1.65c plus lead. Lead pipe, 23.00c.

ZINC

Sheets 23.00c, f.o.b. mill 36,000-lb and over, cut-size sheets in coils 26.00c f.o.b. mill 36,000 lb and over. Plates, not over 12-in. 21.75c; over 12-in. 21.75-22.25c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold rolled 77.00c; Strip, cold-rolled 83.00c; Rods and shapes 73.00c; Plates, 75.00c; Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold rolled 60.50c; Strip, cold-rolled 63.50c; Rods and shapes, 58.50c; Plates, 59.50c; Seamless tubes, 93.50c; Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 14	24.50	14.00	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 9	24.50	14.00	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 7	24.50	14.00	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 1-6	24.50	15.80	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Sept. 25-30	24.50	15.80	13.50-14.00	121.50	20.00	39.00	56.50	83.25
Sept. 22-24	24.50	15.80	13.50	121.50	20.00	39.00	56.50	83.25
Sept. 18-20	24.50	15.80	14.00	121.50	20.00	39.00	56.50	82.25
Sept. Avg.	24.50	15.80	13.90	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.80	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.00	15.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	83.356
Oct. 1951 Avg.	24.50	15.726	19.426	103.00	19.00	42.00	56.50	88.12
Oct. 1947 Avg.	21.50	14.825	10.50	80.00	15.00	33.00	55.00	71.375

NOTE: Copper, electrolytic del. Conn. Valley. Lead, common grade del. St. Louis; Zinc, price western f.o.b. St. Louis. Tin, Straits del. New York. Aluminum primary ingots, 99% del.; Antimony, bulk, f.o.b. Laredo, Tex. Nickel, electrolytic cathodes, 99.8%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c; 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, $1.15; more than 2000 lb, $1.00. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 0 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze shilds and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 11.75-12.00; battery plates 6.50-7.00; linotype and stereotype 13.50-14.00; electrotype 11.75-12.00; mixed babbitt 14.50-14.75.

Zinc: Old zinc, 6.00-6.50; new die cast scrap, 6.00-6.50; old die cast scrap, 4.75-5.00.

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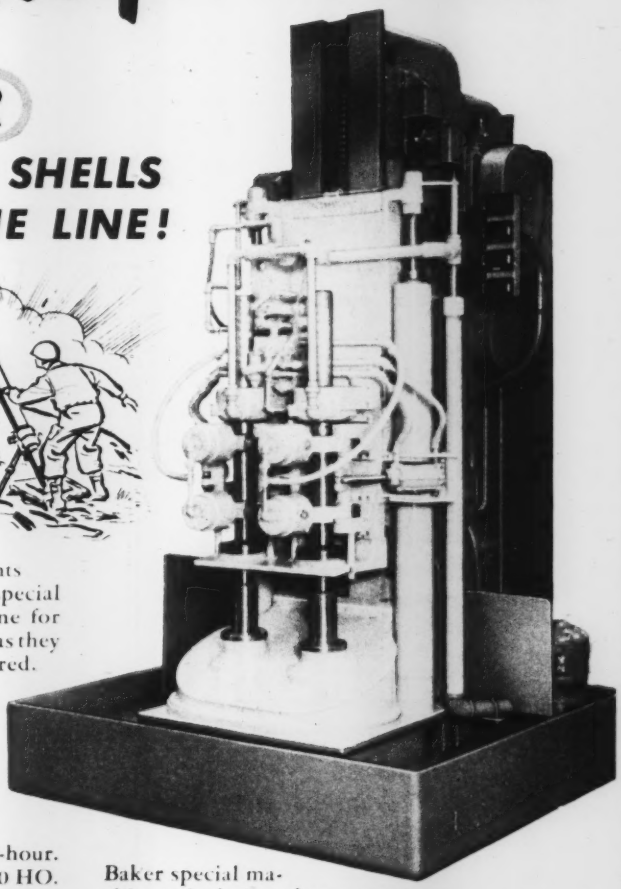

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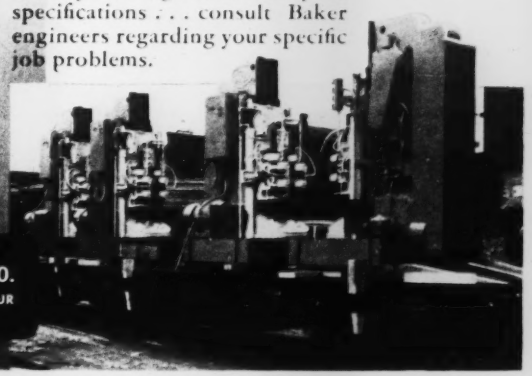

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Steel Bars . . .

Bar Prices, Page 149

New York—Most carbon bar sellers here have allocated tonnage for first quarter to commercial consumers. Relatively little new tonnage is involved because of fourth quarter carryovers set-asides for military requirements and quotas for warehouses and converters. Military set-asides are being absorbed to the limit as shell specifications become heavier, affecting particularly the large diameters, 3-in. and over.

Boston—First quarter openings for civilian bar tonnage are limited. In completing distribution schedules for that period, some producers have space in one month only, March. Only turnbacks in military set-asides will increase available tonnage. Up to now the military has taken all volume allotted.

Philadelphia—No signs of easing are noted in carbon bar demand. If anything, supply is tighter with the shell program expanding and other defense requirements increasing. Non-defense requirements are highly diversified and active.

Pittsburgh—Outlook for steel bar supplies is improving. Practically no fourth quarter business was booked except for military account and, as a result, the carryover will be smaller than heretofore anticipated.

Cleveland—Bars continue in tightest supply of all the major steel products. And with no early slackening in military and related defense requirements in prospect, consumers are resigned to an indefinite period of shortage.

St. Louis—Merchant bars continue in tight supply and heavy demand. Although this area produces small tonnage, outside inquiries are numerous. First quarter books will open in two weeks, but carryover will account for the first month. Farm equipment manufacturers are pressing hard for deliveries.

Sheets, Strip . . .

Sheet and Strip Prices, Page 149 & 150

Philadelphia—Pressure for sheets is increasing. Sellers claim demands now are the heaviest in months, especially for cold-rolled sheets. In addition, manufacturers of consumer durables are anxious to build up inventories. Prior to the steel strike, they were in good inventory position. But during and since the strike they have been chewing steel up at a faster rate than it has been coming in. More conversion steel is entering the picture. One eastern consumer recently closed on 2500 tons of cold-rolled conversion sheets for delivery in first quarter at a premium price of 8.50c per pound delivered.

Boston—Sheet supply has deteriorated with most shops, notably more active stampers with automotive work. Inventories are depleted and tonnage frequently moves directly from cars to presses. Considerable volume of fourth quarter tickets is unplaced and, with no mill openings, are being written off. Authorizations for A products for first quarter are few. There are scattered openings for stainless orders in December schedules. Nonintegrated cold-rolled strip mills have limited space for late fourth quarter, but schedules for that period are all but taken.

Pittsburgh—Steel sheet supplies remain tight, but some easing is expected in first quarter. Some open tonnage may be available in January and February.

Cleveland—Sheetmakers continue under pressure for tonnage and anticipate no letup before end of first quarter. The mills, however, are beginning to show more interest in small lots than has been the case for some long time past. For example, one manufacturer on defense account in this area whose purchases seldom exceed five tons at a time, is having noticeably less difficulty placing its needs direct with the mills. Heretofore, it has been compelled to fill most of its requirements for sheets from warehouse.

Birmingham—Sheet demand is strong. Supplies are in slightly better balance with demand. Bale ties account for considerable strip tonnage.

Los Angeles—Mills are 60 to 90 days behind on delivery promises. However, Columbia Steel Division, Torrance plant, U. S. Steel Co., recently delivered galvanized sheets to a small consumer 30 days before the promised date.

Structural Shapes . . .

Structural Shape Prices, Page 149

Cleveland—Structural fabricators display increasing concern for business after the turn of the year. Government restrictions limiting steel allotments is discouraging commercial building and there isn't enough new defense-related work coming out to assure all shops of sustained operations over coming months. Competition for the new work that appears is keen. No easing in tight structural steel supply is seen until first quarter next year, however, with defense set-asides heavy.

Boston—Structural fabricators are unable to place all their fourth quarter tickets. Where tickets are placed, material will not be rolled until January-February. In addition to structural shops, other industries using structural steel are complaining over the 30-day inventory limitations. Rolling cycles and varying deliveries of other steel products contribute to inventory difficulties.

New York—Structural steel activity is spotty, reflecting in part governmental restrictions on commercial work. Another factor is high cost of building and possibility that within another few months there may be a general easing which would make it profitable for builders to wait.

Philadelphia—Structural activity continues light. Fabricators, however, have plenty of work ahead. In fact, major concern is obtaining sufficient plain materials to give them a balanced operation.

Pittsburgh—Pressure for delivery of structurals is showing some signs of slackening but the situation is believed only temporary until new construction plans become final.

Bakersfield, Calif.—Shortage of heavy construction steel is slowing up building of schools and other jobs in this area.

Seattle—Some fabricating shops

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are nearing the end of their order backlogs. Largest pending project is the Dalles bridge, Oregon, bids Oct. 15. This involves about 1000 tons additional. For the original structure, canceled by the U. S. Engineers for a Columbia river dam, 2000 tons were fabricated by the Judson-Pacific Co., Oakland, and will be used.

Rails, Cars . . .

Track Material Prices, Page 151

New York—Domestic freight car deliveries in September of 3762 units were the lowest since July 1950, according to the American Railway Car Institute and the Association of American Railroads. Deliveries compared with 8533 in September a year ago. New orders totaled 3628 and brought the order backlog as of Oct. 1, to 95,377. Of orders placed last month 2208 cars went to railroad shops and 1420 to commercial car builders.

In the latest annual edition of *Railway Car Facts* for 1951, published by the American Railway Car Institute, it is revealed 16.8 per cent of all freight cars owned or leased by class I railroads are more than 30 years old. Statistically, 30 years is regarded as the average maximum life of a car. The entire fleet of class I railroads, numbering 1,756,648 cars, has an average age of 19.2 years, and the Car Institute points out, "this entire fleet is two-thirds worn out and about one-sixth of it is running on borrowed time."

Plates . . .

Plate Prices, Page 149

Pittsburgh—With numerous customers holding military tickets plate demand exceeds supply. Pinch is particularly noticeable in wider plates. Production is expected to be current with military tickets.

The Reading closed on four diesel tug boats to the RTC Shipbuilding Corp., Camden, N. J.

Boston—Shops with Z-2 ratings, weldments mostly, have been able to place fourth quarter allotments and some first quarter volume. This priority covers 80 per cent of weldment shop backlogs which are again mounting, now averaging four to five months. Stainless clad deliveries are more extended, six months in some cases with nickel alloys short.

New York—District plate sellers have little tonnage to offer commercial consumers for first quarter. Tonnage moving against fourth quarter tickets for shipment in January and February, along with set-asides and special directives, will take up most of their production in the first two months of the quarter and such new business as they will be able to accept will be confined mostly to March.

Philadelphia—District plate mills are running well behind on nondefense work. Consumers are getting substantial tonnage as most mills are operating near capacity, but shipments are of tonnage long since overdue and are not as large as fabricators would like. Most consumers complain of unbalanced inventory which adversely affects operations.

Birmingham—Steel interests foresee no appreciable change in the tight plate supply situation. There is slight

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prospect of significant easing in conditions soon.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 149

Los Angeles—Reinforcing bar producers are taxed to supply needed tonnage. Engineering construction, totaling $30,527,248 in September, was the highest on record for that month, and 54.8 per cent above August and 83.5 per cent more than in September last year, in southern California, southern Nevada, and Arizona.

San Francisco—An easier situation exists here in the availability of reinforcing steel bars.

Seattle—Order backlogs will support steady mill operations through fourth quarter. New inquiry, however, is slower.

Tin Plate . . .

Tin Plate Prices, Page 150

San Francisco—Canning operations have suffered little because of container shortages. Container makers were able to supply all vital needs despite the heavy loss of tin plate production during the long steel strike. In a few instances, farmers were obligated to keep a small percentage of their crops a little longer than usual and there was some loss as result of down-grading to seconds. Pacific Can Co. is trying to buy a 32-acre site in Santa Clara, 50 miles from here, for a site for a can plant.

Wire . . .

Wire Prices, Page 151

Boston—Wire mills are close to normal delivery schedules on more carbon products. Where books are open for first quarter there is no rush to cover. While some lack tickets, consumers with authorized allotments are slow to make forward commitments. Trend is toward heavier sizes in heading wire. Automotive demand is more active. Capacity for low carbon wire for staples is filled for fourth quarter.

Tubular Goods . . .

Tubular Goods Prices, Page 153

Cleveland—Reflecting the recent reduction in zinc to 13.50c per pound, Republic Steel Corp. last week announced reductions in prices on galvanized pipe. Effective Oct. 13 the company raised the discount on ½-in., ¾-in. and 1-in. galvanized pipe, 1 point; on 1¼-in., 1½-in. and 2-in. discounts were raised ¾ point; and on 2½-in. and over the discount was increased ½-point.

Boston—Pipe and tubing are sold well into first quarter with light wall electric welded tubing the exception. General pattern finds tonnage available in buttweld and seamless pipe reduced with heavy accumulation of DF and lower rated orders for direct shipment. Potential improvement in buttweld pipe has not carried through. Tubing specialties are sold out except for mechanical, 1½-in. and under, cold formed, and some spotty openings for carbon pressure tubing. Military demand set-asides remain high.

St. Louis—Scarcity of pipe in

smaller sizes is beginning to hurt residential and commercial building, warehousemen say, because delivery delays prevent dealers getting full allotments. Pipe makers' order books are filled through the year.

Los Angeles—Pipe fabricators, despite extreme shortages of skelp, face huge demand. Standard Oil Co. of California will construct a 104-mi., 8-in petroleum products pipeline from Pasco, Wash. to Spokane to be built by Salt Lake Pipe Line Co.

Iron Ore . . .

Iron Ore Prices, Page 155

Cleveland—Iron ore continues to move down the lakes in record volume. Shipments in the week ended Oct. 13 totaled 3,141,106 gross tons, increase of 75,479 over the preceding week, and 138,297 tons greater than in the corresponding week of 1951. Cumulative shipments in the 1952 navigation season to Oct. 13 stand at 57,360,273 tons, comparing with 75,997,872 a year ago. In September the fleet hauled 14,388,632 gross tons, largest for any one month in history. Shippers are striving to overcome the tonnage deficit resulting from the June-July steel strike. This now stands at 18,637,599 tons. To reach a total movement for the season of 75 million tons, the lake shippers must bring down 17,639,727 tons before adverse weather halts navigation on the lakes for the winter.

Pig Iron . . .

Pig Iron Prices, Page 148

Cleveland—Reports in the trade to the effect demand for merchant pig iron is slowing down are not confirmed by sellers here. While pressure for shipments is sluggish from the light foundries, shops on defense work and motor castings continue to take all the iron they can get. Consequently, there are no excess supplies pressing on the market. In fact, some specialty irons are actually short.

Chicago—Foundry business is spotty and demand for pig iron is in relative balance with supply. Farm implement and automotive foundry melts are off, the former because of strikes and the latter due to approaching model changes. Of the district's 42 blast furnaces, 40 are active.

Boston—Only basic iron is relatively tight. Combination of low melt and inventory limitation holds down foundry and malleable iron shipments, but releases are somewhat heavier than last month.

New York—Strike at eight gray iron foundries in the Newark area continues, with some indications it may spread. Meanwhile, pig iron is being diverted to other consumers and up to now demand has kept pace with supply.

Buffalo—Blast furnace operations here are averaging 88 per cent of capacity. Small foundries are seeking new business, but producers of merchant iron report no trouble in disposing of their output. An estimated 75 to 80 per cent of iron production here is going into steelmaking.

Philadelphia—Pig iron is moving as fast as it is produced. Basic iron consumers want more than they are getting and buyers of foundry grades

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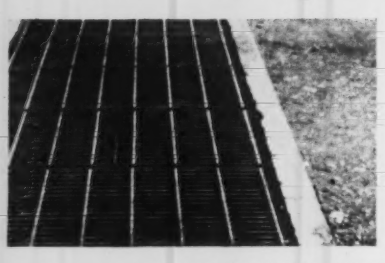

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are taking all the tonnage offered them.

Birmingham Merchant iron production in the district is at capacity. Demand, however, exceeds output despite the fact some cast iron pipe shops are on reduced schedules.

Fairfield blast furnace group of Tennessee Coal & Iron Division, U. S. Steel Co., in September set an all-time record. Although only a 30-day month, output of basic iron by the stacks increased more than 2000 tons over the best previous month. Production was 101,241 tons compared with 99,233 tons last March.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 155

Philadelphia The situation in coke is unsettled pending final clarification as to what is going to happen in coal. Most coke consumers in this area expect the mine workers will get Washington approval of the recently agreed upon boost in wages, with higher coke prices eventually materializing.

Chicago Foundry coke is in plentiful supply. Shipments are off because many consumers who had earlier built up inventories in anticipation of a coal strike now are leveling out stocks. Furthermore, strikes are interfering with operations at farm equipment foundries.

Scrap . . .

Scrap Prices, Page 156

Philadelphia Estimates of a 7-million-ton scrap inventory at steel mills throughout the country do not find support among trade leaders here. They doubt if inventories amount to even 6 million tons though admitting the mills are in comfortable position. Locally, the mills generally have substantial stocks but dealers hold relatively little, and there is sufficient tension to maintain prices. All steel grades are at ceiling. Meanwhile, three cargoes of scrap are enroute to Baltimore, one each from Korea, Guam and Hawaii. Some weakness continues in No. 1 cupola cast and unstripped motor blocks although prices are unchanged from a week ago. The $42 delivered price on unstripped motor blocks is nominal.

Boston Steel scrap is moving in good volume at ceiling prices, but with mills holding shippers to specifications. Yards are not building inventories as steel is coming out in limited volume. Cast grades are soft and slow. Several grades firmed up $1 ton, but are still $4 to $7 under ceilings.

New York Scrap brokers' prices are unchanged with continued strong pressure for steel scrap, but some easing in cast is due to the AFL strike at eight gray iron foundries in the Newark area.

Buffalo Failure of a leading scrap consumer here to lift its embargo on shipments has been something of a blow to dealers. However, the embargo is no indication of weakness being due to the fact mill loading facilities are taxed by heavy ore receipts. Other mills have placed new orders for steelmaking grades at ceiling levels. Expected strength in cast grades has failed to develop with new business in cupola cast placed at

$45.50 to $46.50, which is $2.50 to $3.50 under ceiling.

Pittsburgh—Mills here holding at least 60-days supply of scrap and aren't buying. Prices are at ceiling, however, despite lack of activity.

Cleveland—Although steel mill scrap stocks are comfortable, steady flow of material from dealers' yards and industrial plants is anticipated in view of continued high level steelmaking operations. Premium grades of scrap are in strong demand. Most dealers' yards are pretty well cleaned of material. No slackening in steel operations is indicated over the next six months and with winter on the way the scrap trade sees a tightening up in supply as adverse weather hampers collections and preparation. Ceiling prices prevail on steel grades but sluggish demand for the foundry grades is reflected by price softness.

Chicago—Substantial scrap inventories and steady flow of industrial grades explain current mild interest of mills in new acquisitions. Dealer scrap and blast furnace grades attract little attention. Real slack is in cast grades.

St. Louis—Scrap dealers are unable to get shipments to cover current contracts. Nearly all are past due on commitments.

Birmingham—Shortages are developing in heavy melting and cast grades in this district. The greater portion of melting steel is moving out of the district with the area's largest consumer out of the market.

San Francisco—Scrap prices, both on cast and open-hearth grades, remain steady despite the absence of pressure for delivery.

Seattle—The scrap market is steady with receipts fair and inventories up slightly.

Warehouse . . .

Warehouse Prices, Page 155

Boston—As mill shipments improve warehouse volume rises correspondingly. Distribution is hampered, however, by lack of balance in sizes and grades. Plates, shapes and larger bars move to buyers from cars and there is no building of inventory on these products, although light plate shipments are up.

Philadelphia—Most warehouses expect business this month will equal that for any other month this year. One large distributor questions if October sales will surpass March, however.

Pittsburgh—Warehouse stocks continue unbalanced here. Tonnage flow from the mills is substantial but is not in sufficient volume to assure complete inventory range on all types.

Cleveland—While warehouse stocks continue highly unbalanced, inventories are building up steadily. One large distributor reports its September receipts were the heaviest in months and anticipates steady gains from here on. Meanwhile, consuming demand is described as strong with volume held down by the lack of stock balance. Buyers still have to do considerable shopping around to satisfy all their needs. However, except for large bars, structurals and heavy plates, acute shortages are gradually fading out.

Chicago—Despite substantial receipts, warehouse inventories are only about half pre-strike size. Demand

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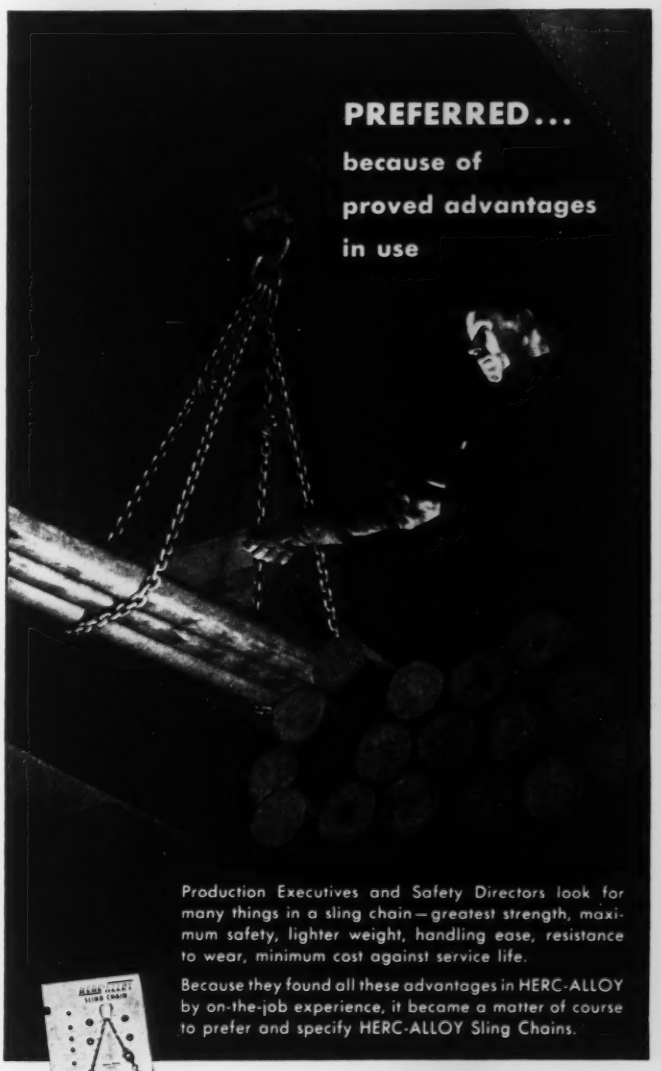

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Below strong but isn't as pressing as a month ago.

Los Angeles—Warehouse steel sales are steady. Demand is active. Distributors' stocks, about 60 to 70 per cent of normal, are unbalanced.

Seattle—Warehouses report sales volume is steady. Business outlook is improved but low inventories seriously restrict volume. Plates and sheets continue in tight supply. Wide flange sections are scarce.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 153

Cleveland—Industrial fastener manufacturers are still awaiting OPS action granting them additional price relief to care for increased labor and other costs over past months. Recently, permission was given to raise prices sufficiently to cover higher raw material costs, such as steel, but this pass-through covered only a part of the overall cost increase in recent months. Current demand for fasteners is substantial but some makers could accommodate additional business. Steel supply, including bars and flats, is reported improving.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1250 tons, shapes and bars, aircraft maintenance hangar, naval air station, Oceana, Va., and Hall-Hodges, Norfolk, Virginia Engineering Co., Inc., Newport News, Va., general contractor.

700 tons, power station, Tampa Electric Co., Tampa, Fla., to Bristol Steel & Iron Works, Inc., Bristol, Va.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

200 tons, Edison junior high school, Harrisburg, Pa., to Milton Steel Supply Co., Milton, Pa.

150 tons, buildings, Sacred Heart Academy, Plymouth, Mass., to Grosser & Shlager, Somerville, Mass.; Charles Logue Building Co., Boston, general contractor.

STRUCTURAL STEEL PENDING

1500 tons, including 1700 tons low-alloy steel, bridge superstructure, Ohio river, Lawrenceburg, Ind., bids Nov. 12, Indiana State Toll Bridge Commission, Indianapolis; also 38,500 lineal feet of steel piling.

1000 tons, Columbia river bridge, bids to county court, The Dalles, Ore., Oct. 15.

650 tons, general purpose warehouse for the Army, Metuchen, N. J., bids Oct. 22.

200 tons, senior high school, Canton, Pa., bids asked.

150 tons, additional steel for Lucky Peak powerhouse, bids to U. S. Engineer, Portland, Ore., Nov. 1.

100 tons, state bridge, Wayne county, Pennsylvania, bids Oct. 31.

100 tons, access bridge, Lookout Point dam project, bids in to U. S. Engineer, Portland, Ore.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, light department administration building, Tacoma, previously placed with Northwest Steel Rolling Mills, Inc., Seattle, general contract to Roy T. Early Co., Tacoma, $1,120,000.

350 tons, power station, Tampa Electric Co., Tampa, Fla., to Florida Steel Products Inc., Tampa; Stone & Webster Engineering Corp., Boston, contractor-engineer.

REINFORCING BARS PENDING

600 tons, Columbia river bridge, bids to county court, The Dalles, Ore., Oct. 15.

310 tons, Columbia river pumping plant, Hanford, Wash., bids to Atomic Energy Commission, Nov. 18.

115 tons, 270-foot three-span reinforced concrete bridge, Hopkinton-Richmond, R. I., bids in, Providence, R. I.

100 tons, Ladd Field, Alaska, family quarters, Kuney-Johnson Co., Seattle, low to U. S. Engineer.

200 tons, Fairchild air field, Washington state, dormitory, bids in.

100 tons, Washington state, Clark county, underpass, general contract to H. Halvorson Inc., Portland, Ore., $256,500.

PLATES . . .

PLATES PENDING

175 tons, 200-corrugation steel standpipe, Hartford, Falls, N. Y., Chicago Bridge & Iron Co., Chicago, low.

PIPE . . .

CAST IRON PIPE PLACED

1200 tons, 6-in. to 12-inch cast iron pipe, Metropolitan District commission, Hartford, Conn., to Warren Foundry & Pipe Co., Everett, Mass.

200 tons, 8 to 12-inch cast iron pipe, naval air station, Brunswick, Me., to United States Pipe & Foundry Co., Philipsburg, N. J., through Gil Wyner Co., Malden, Mass., general contractor.

150 tons, 3-inch cast iron pipe, Holyoke, Mass., to Warren Foundry & Pipe Co., Everett, Mass.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Canadian Pacific, 73 diesel locomotives, awarded as follows: 10 to the Canadian Locomotive Co., Kingston, Ont.; 29 to the Montreal Locomotive Works, Ltd., Montreal, Que., and 34 to General Motors Diesel, Ltd., London, Ont.

RAILS PENDING

Alaska Railroad, 1725 tons, 115-lb., bids to General Services Administration, Seattle, Oct. 21.

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Canadian Furnace Doubles Capacity

Canadian Furnace Co. Ltd., subsidiary of Algoma Steel Corp., Ltd., Sault Ste. Marie, Ont., is installing a double-stand pig iron casting machine which will double the pouring capacity of its plant in Port Colborne, Ont. The expansion program, including a steam generating unit, will cost about $1.5 million.

Babcock & Wilcox Opens Branch

Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa., established a district sales office at 205 Harrison St., Syracuse, N. Y. J. Y. McCandless is district manager.

Sierra Drawn Steel Builds Plant

Sierra Drawn Steel Corp. is erecting a plant for production of turned and polished shafting at 6600 Airport Way, Seattle. Operations are scheduled to start in November. James Allison is the Seattle manager of the firm.

Marman Products Completes Project

Marman Products Co. Inc., Los Angeles, completed construction of its $1 million plant at 11214 Exposition Blvd., that city, for manufacture of clamps, stamps and couplings.

Youngstown Group Buys Chicago Firm

A group of investors in Youngstown purchased Bates Expanded Steel Corp., Chicago, and will move its plant to the Ohio city.

Apparatus Firm Opens New Plant

Liebel-Flarsheim Co., manufacturer of X-ray, electrosurgical and physiotherapy apparatus, moved its business operations to 111 E. Amity Rd., Cincinnati.

Names for Ore Vessels Selected

Two new vessels which Columbia Transportation Co., Cleveland, has under construction will be named *Armco* and *Reserve*. The latter vessel is being built by Great Lakes Engineering Works at Detroit and will be launched in November. The *Armco* is being built at the Lorain, O., yard of American Shipbuilding Co. and is scheduled to be launched in December. The *Armco* will become flagship of the Columbia fleet, succeeding the present flagship *Joseph H. Frantz*. Construction of these freighters represents an investment of over $11 million. General dimensions of the vessels are: Over-all length, 647 ft; beam, 70 ft; depth, 36 ft. Depending on allowable draft, they will carry 18,000 to 20,000 tons of cargo. Operator of the Columbia fleet, now totaling 18 ships, is Oglebay, Norton & Co., Cleveland.

Cory Consolidates Sales Units

Cory Corp., Chicago, manufacturer of household appliances, consolidated its Cory and Fresh'nd-Aire national sales organizations. Sales of Fresh'nd-Aire air treatment products were handled previously through manufacturers sales representatives.

Kaydon Engineering Names Agent

Frauenthal Division, Kaydon Engineering Corp., Muskegon, Mich., appointed Neff, Kohlbusch & Bissell, Chicago, as selling agents for Frauenthal high-precision grinders.

Offers German Tube-Mill Machinery

Henry A. Spittler, New York and Monroe, N. Y., is now the distributor of precision tube-mill machinery made in Germany. These products are Banning, Kieserling & Albrecht, Boling & Schafer equipment, including tube benders, cutters, pointers, swagers, polishers, draw bench machine and tube or bar straighteners.

Hancock Steel Opens Chicago Branch

Hancock Steel Co. Inc., Detroit, opened a branch office in Chicago and named Charles A. Israel its representative.

Metal Institute Elects Officers

Pressed Metal Institute, Cleveland, elected as officers: President, Wallace F. Ardussi, president, Variety Machine & Stamping Co., Cleveland; vice president, Samuel P. Hull, sales manager, Worcester Stamped Metal Co., Worcester, Mass.; secretary and treasurer, Hunter Morrison Jr., vice president, Morrison Products Inc., Cleveland.

Maytag Widens Development Program

Maytag Co., Newton, Iowa, is constructing a building which will double the facilities of its Research & Development Division. This is part of the company's long-range expansion program. T. R. Smith is the director of research and development.

Canadian Distributorship Established

Great Northern Carbon & Chemical Co. Ltd., Montreal, Que., was appointed exclusive agent in Canada for several divisions of Great Lakes Carbon Corp., Niagara Falls, N. Y. This sales organization will distribute Great

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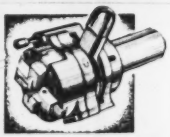

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Ampco Metal Expands Burbank Plant

Ampco Metal Inc., Milwaukee, will expand capacity of its Burbank, Calif., plant by about 50 per cent. It is essentially a foundry operation but also serves as a warehouse center for the company's West Coast sales operations.

Continental Can To Build in Omaha

Continental Can Co. Inc., New York, purchased a 10-acre plant site in Omaha, Nebr., and will start construction in November of a plant for the manufacture of metal containers. The plant should be in production in 1953.

Hyster Transfers Divisional Office

Hyster Co., Portland, Oreg., moved its Eastern Division's industrial truck sales and service departments to Danville, Ill., from Peoria, Ill. Philip S. Hill is general sales manager; Jack F. Lewis, general parts and service manager.

Lamb Steel Co. Organized

Jack E. Lamb, formerly industrial analyst in the Chicago regional office of National Production Authority, organized the Lamb Steel Co. Warehouse and offices of the firm will be located in Gary, Ind.

Riordan Heads Machine Tool Group

American Machine Tool Distributor's Association, Philadelphia, elected as officers: President, John M. Riordan, Riordan Machinery Co., Detroit; vice president, E. R. Motch Jr., Motch & Merryweather Machinery Co., Cleveland; second vice president, Thomas R. Rudel, Rudel Machinery Co. Inc., New York; secretary-treasurer, George B. McClennan, Delta Equipment Co., Philadelphia.

More Business Coming to Northwest

Pacific Car & Foundry Co., Renton, Wash., is placing in commission the 10,000-ton floating drydock YFD-23 which is now located at the Everett, Wash., yard. The dock will enable the company to lift sea-going cargo ships and will provide additional dock facilities for carrying on other marine repairs. It should result in additional work being placed at Everett metalworking shops. Pacific Car & Foundry's machine shop at the yard in Everett is engaged in machining parts for other Pacific Car contracts being fulfilled at Kenworth Motor Truck Co. and the Renton plant; the steel shop is fabricating parts for producing LVT's under contracts with the Navy. Any marine repairs undertaken at Everett by virtue of commissioning the dry dock will require subletting portions of machine and steel requirements to outside concerns.

Tall Crane Picks Scrap

Resembling a debris-strewn battlefield is this scrapyard at the Westwego Salvage Co., Westwego, La. A magnet-equipped crane brings order out of chaos by picking scrap iron off the ground and loading it into a freight car. A Caterpillar diesel D-315 engine provides power for the crane. Destination of the scrap iron is one of the nation's steel mills.

Hewson Appoints Representatives

John Hewson Co., New York, appointed Cooper-Morgan Inc., Hamburg, N. Y.; Naylor Electric Co., Syracuse, N. Y.; and Rittenhouse & McGuire Co., Rochester, N. Y., to handle sales, field applications and servicing of its line of high-voltage insulation testers and high-speed static controls.

Paulsen-Webber Establishes Branch

Paulsen-Webber Cordage Corp., New York, established a branch office and warehouse with shop facilities at 906 Brooks St., Houston. Principal activity will be in wire rope and manila ropes. Eugene R. Lambert is manager of the Houston branch. The company recently acquired additional manufacturing facilities at 32 Hamil-

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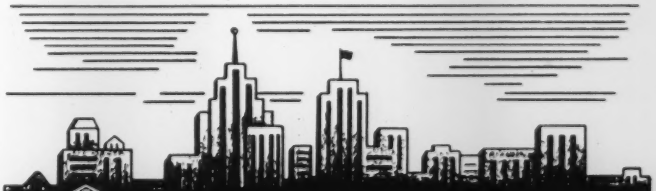
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ton Ave., Brooklyn, N. Y. These facilities were obtained as a result of the selection of the company as one of the Navy's major sources for the manufacture and fabrication of wire rope for harbor defense antisubmarine nets. The acquisition is part of the company's expansion program which has tripled its wire rope production.

Producto Machine Opens Branch

Producto Machine Co., Bridgeport, Conn., opened an office and warehouse at 45 Scio St., Rochester, N. Y. The company produces tool and die makers' tools and accessories. David Hodgson is the district sales manager.

Precision Metalsmiths Names Agents

Precision Metalsmiths Inc., Cleveland, manufacturer of investment castings, appointed Crandall Co. to its sales organization. The Crandall representatives are: Willard Crandall, Dayton, O.; Harry Edwards, Milford, O.; and Howard A. Meanor, Indianapolis.

Lindberg To Build on West Coast

Lindberg Engineering Co., Chicago, purchased a plant site in Los Angeles where it plans to build a western branch.

Electric Supply Firm Issues Catalog

National Electric Products Corp., Pittsburgh, was elected to membership in the Railway Electric Supply Manufacturers Association, Chicago. The firm also has just issued a catalog on railroad wiring materials, covering installations in diesel locomotives and diesel maintenance shops.

Apex Smelting To Build Oregon Plant

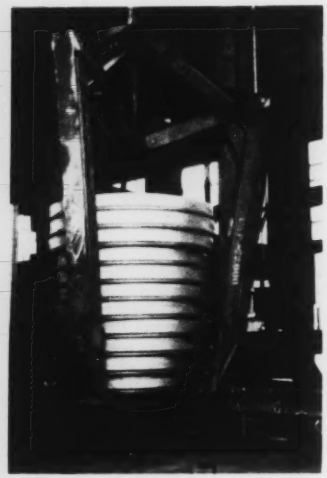
Apex Smelting Co., Chicago, plans to build a silicon aluminum plant in Springfield, Oreg. Ingots would be produced by using clay from the Cottage Grove, Oreg., area. The company has been working with the Bureau of Mines in developing the process.

Mineral Fiber Group Elects Officers

Frank Christenson, executive vice president, Refractory Insulation Corp., New York, was elected president and chairman of the board, Industrial Mineral Fiber Institute, formerly Industrial Mineral Wool Institute, New York. J. S. Blunt, Holmes Foundry Co. Ltd., Sarnia, Ont., was elected vice president. W. H. Ehrlich, M. H. Detrick Co., Aurora, Ill., treasurer.

Waterman-Western Co. Organized

Waterman-Western Co. was organized to manufacture power transmission equipment. Donald Waterman is president of the firm. The company plans to establish a plant near W. A. Waterman Co.'s foundry in Exeter, Calif.



Steel Jaws Lift 11 Tons

Like giant steel jaws, these automatic tongs at Edgewater Steel Co., Oakmont, Pa., carefully lift steel tires for locomotive wheels. Made by Heppenstall Co., Pittsburgh, the tongs transport loads of as much as 11 tons. Jaws close on stacks of tires and cannot release the pile until it again rests on a solid surface. A craneman in his cab above controls movements of the tongs.

Glidden Exploring Zinc Deposits

Glidden Co., Cleveland, is exploring deposits of zinc it owns in Shasta county, California. Diamond drilling is being employed. The government has contributed 50 per cent of $300,000 cost in an effort to stimulate domestic zinc production.

Tool Engineers Charter 101st Chapter

American Society of Tool Engineers, Detroit, chartered its 101st chapter in Scranton, Pa. The new chapter, known as the Keystone Chapter, will have more than 83 members. Its chairman is Jack Lipman, Daystrom Instrument Division, Daystrom Inc., Archbald, Pa.

Westinghouse Expands in Boston Area

Sturtevant Division, Westinghouse Electric Corp., will construct a $1,250,000 addition to its Hyde Park, Mass., plant to be completed in 1953. Harry E. Seim is vice president and general manager of this division which manufactures air conditioning equipment, commercial fans and blowers.

CLASSIFIED

Help Wanted

WAREHOUSE MANAGER
Industrial steel warehouse located in Southwest seeking manager experienced in all phases of warehouse operation. Write Box 581, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Between the age of 28 and 35. By large producer of basic refractories and industrial chemicals. Steel mill experience in either metallurgy or ceramics preferred. Must be willing to relocate, if necessary. Write Box 587, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Sales Engineer, over 20 years experience selling Screw Machine Products in Connecticut, Rhode Island, New York State, desires to represent on commission basis Screw Machine Products manufacturer, also Spring & Metal Stamping manufacturer, or manufacturer of other tie-in items. References upon request. Write Box 576, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite, or All Steel, 50-Ton and 70-Ton
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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
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10 gauge 36" x 96", 20,000 lbs.
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Material is HRAP #1 finish. Original mill packing on skids. Mill test reports available.

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An excellent opportunity to associate with a leader in its field. Must be familiar with general foundry practices and techniques.

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STAINLESS STEEL ROUND BARS

	TYPE 303				**TYPE 303**		
3/16"	Diameter	Weight	500 lbs.	1-3/4"	Diameter	Weight	2,157 lbs.
5/16"	"	"	620 lbs.	1-15/16"	"	"	2,400 lbs.
1/2"	"	"	500 lbs.	3"	"	"	219 lbs.
5/8"	"	"	228 lbs.		**TYPE 304**		
9/16"	"	"	517 lbs.	1/2"	Diameter	Weight	500 lbs.
11/16"	"	"	231 lbs.	1-5/16"	"	"	1,000 lbs.
3/4"	"	"	1,000 lbs.	3"	"	"	200 lbs.
13/16"	"	"	978 lbs.	3-1/4"	"	"	620 lbs.
15/16"	"	"	23 lbs.		**TYPE 309**		
7/8"	"	"	25 lbs.	5/16"	Diameter	Weight	600 lbs.
1"	"	"	12,000 lbs.		**TYPE 321**		
1-1/8"	"	"	944 lbs.	1"	Diameter	Weight	10,000 lbs.
1-3/16"	"	"	210 lbs.		**TYPE 347**		
1-5/16"	"	"	4,403 lbs.	3/4"	Diameter	Weight	1,002 lbs.
1-3/8"	"	"	2,984 lbs.	1-3/16"	"	"	200 lbs.
				1-21/64"	"	"	1,210 lbs.

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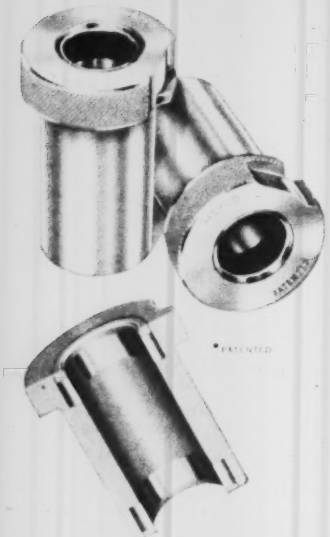
CARBIDE INSERTED
DRILL JIG BUSHINGS



Combining the best features of steel and carbide—here is the answer to increased production and to tough drilling problems: MEYCO Carbide Inserted Drill Jig Bushings.

MEYCO bushings last as long as solid carbide bushings in most cases and cost a great deal less—they will increase the life of drill jigs, fixtures, drills and reamers—they will maintain accuracy for a much longer period of time—they will increase production, save you money in machine-down time, lost man-hours and less spoilage.

MEYCO bushings are made to A.S.A. Standards in Headless Press Fit, Head Press Fit and Fixed Renewable Types. MEYCO Bushings can also be adapted to many special applications—write for fully informative catalog No. 52 today.

Manufacturers of precision tools since 1888

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Cranes Do the Work at Bridgeport Brass Co.

Orderly stacks of supplies and neatly arranged equipment convey a businesslike impression at the Bridgeport Brass Co., Bridgeport, Conn. Bridgeport's continuous rolling mill eliminates back breaking labor of lifting heavy materials by utilization of cranes and conveyors, several of which appear in the above photograph

Griffin Plans Canadian Foundry

Griffin Wheel Co., a subsidiary of American Steel Foundries, Chicago, will construct a railroad wheel foundry at St. Hyacinthe, Que. The company will be known as Griffin Steel Foundries Ltd. and is expected to begin operations in the summer of 1953. Initial production will be 180 freight car wheels a day, in a relatively short time production will be doubled. The wheel is made of low-carbon steel, forced by pressure into graphite molds. After removal from the molds, the wheels are heat treated to remove all internal stresses.

Hooker Chemicals Ltd. Organized

Formation of Hooker Chemicals Ltd., a British Columbia corporation, was announced by R. L. Murray, president, Hooker Electrochemical Co., Niagara Falls, N. Y. The Hooker subsidiary is acquiring a plant site on Burrard inlet in the district of North Vancouver, B. C.

Denison Engineering Opens Branch

Denison Engineering Co., Columbus, O., manufacturer of oil hydraulic equipment, opened a branch office at 1306 W. 63rd St., Chicago. Melvin G. Sulser, central regional supervisor of the company, will serve as manager of the branch.

GE To Build $1.6 Million Shop

General Electric Co., Schenectady, N. Y., will build a $1.6 million service shop in Philadelphia to meet the needs of new steel mills and other industries in the Philadelphia-Camden-Trenton area. It will go into operation in May, 1953, and will be capable of handling transportation, utility and industrial apparatus.

Oklahoma Steel Castings Expands

Oklahoma Steel Castings Co. Inc., Tulsa, Okla., is constructing a small plant at Claremore, Okla., to serve initially as a testing plant for the manufacture of precision steel castings.

Surface Combustion Moves Branch

Surface Combustion Corp., Toledo, O., manufacturer of industrial, domestic and commercial heating equipment, moved its Detroit office to 10333 W. McNichols Rd. Abner Baker is manager of the Janitrol Division district office and Walter F. Herdrich is manager of the industrial sales district office.

National Supply Gets Distributorship

National Supply Co., Pittsburgh, is now the sole distributor within the continental United States for Lister diesel engines, manufactured by R. A. Lister & Co. Ltd., Dursley, Gloucestershire, England.

Marquardt Aircraft Buys Plant

With an RFC loan of $765,000, Marquardt Aircraft Co., Van Nuys, Calif., acquired the $25 million plant and property occupied by it from General Tire & Rubber Co., Akron, O. Marquardt manufactures ramjet and pulsejet power plants and controls.

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Hotel Cleveland

you'll enjoy
friendly, attentive service...
delicious food...
quiet, sleep-inviting rooms...
a sincere and hearty welcome.

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to go in Cleveland.

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Low or high carbon, stainless, special alloy, Armco. You draw the shape—PAGE can draw the wire.

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Tinned stainless or carbon steel. In reels of 50 to 200 pounds. Stainless has high tensile strength, high resistance, low permeability.

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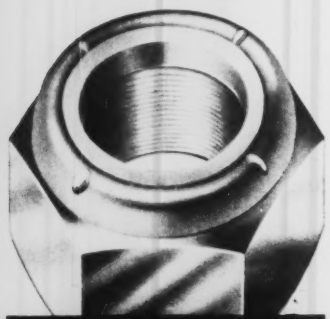

GREER
Stop Nuts

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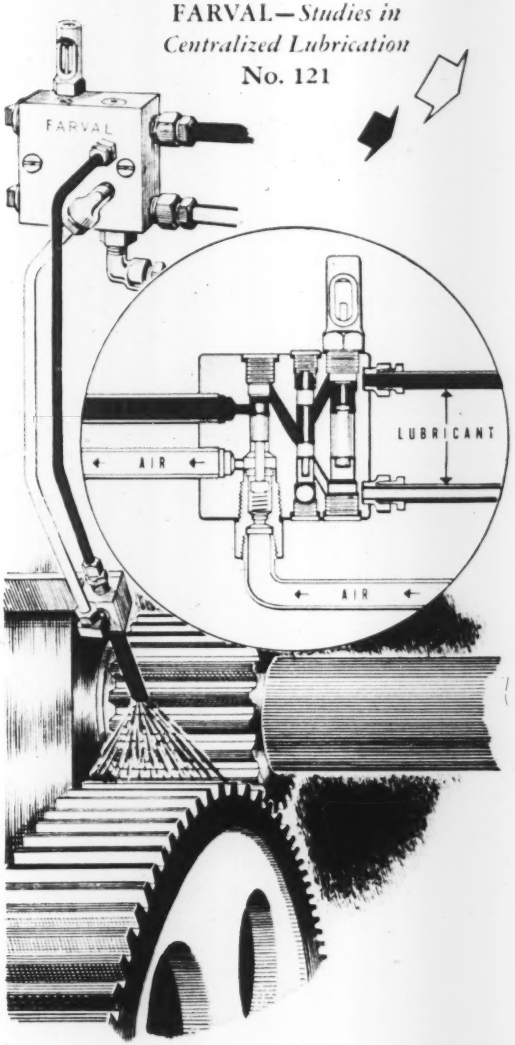
FARVAL—*Studies in Centralized Lubrication* No. 121

FARVAL SPRAY VALVE

meters lubricants to slide surfaces and open gearing



These diagrams illustrate the action of the Farval Spray Valve in delivering a measured quantity of oil onto open gearing. One or more spray valves can be incorporated readily into any Farval Dualine System. Or spray valves can be installed independently, served by their own Farval manual or automatic central pumping unit.

THE value of controlled spraying of lubricant on open gearing, slide surfaces, etc., with the Farval Spray Valve is proved by two years' successful experience in hundreds of plants.

By an ingenious adaptation of the familiar Farval Dualine Valve, either grease or oil is sprayed through a nozzle—on any desired area, in any desired amount, and at any desired interval. The spray valve unit can be added at any point in a regular Farval Dualine System wherever compressed air is available—or a complete system may consist entirely of spray valves, served by either manual or automatic central pumping unit.

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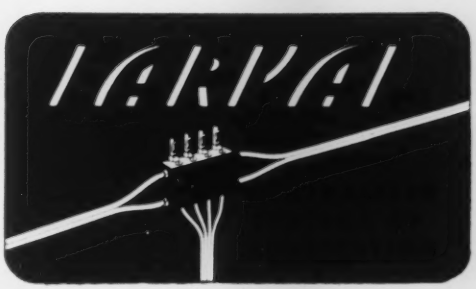
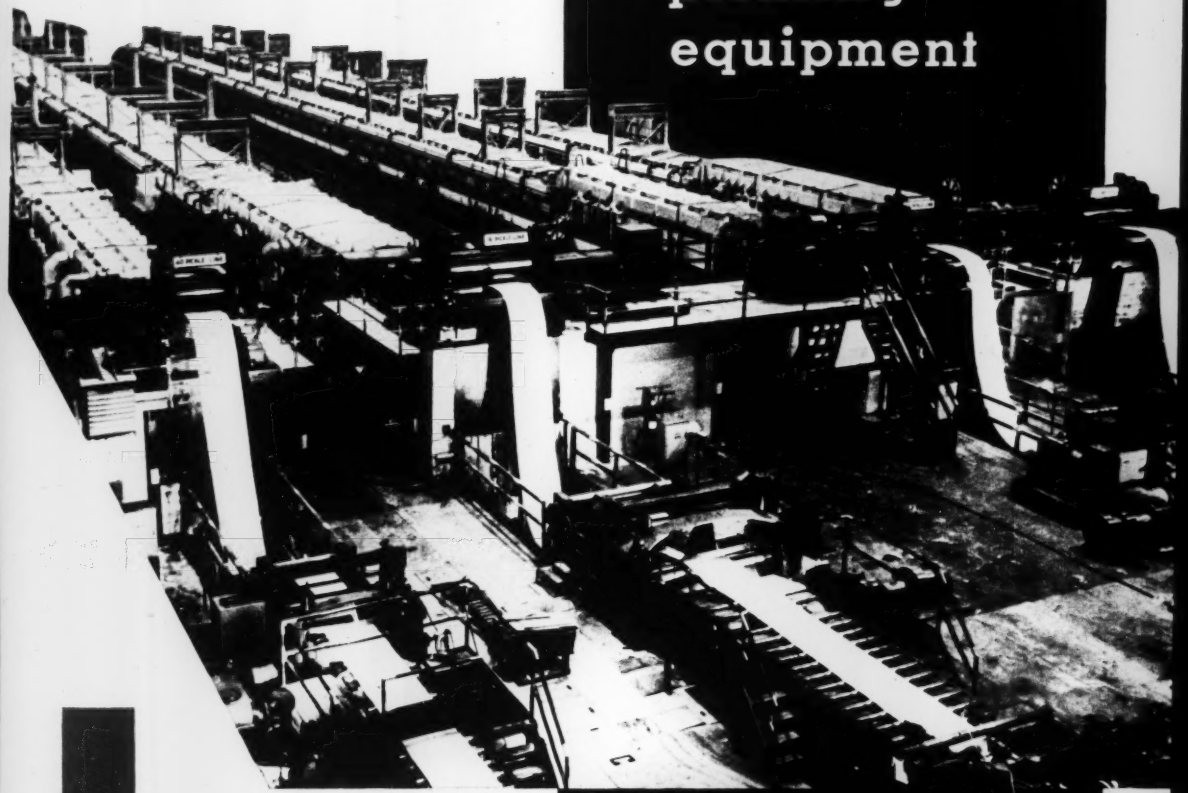
The Farval Spray Valve has been thoroughly tested in service and is now in use on a wide variety of machines and equipment. It has demonstrated its ability to supply lubricant efficiently and economically to open gearing, slide surfaces, in fact, wherever a standard Farval Dualine closed system is not readily adaptable.

Write for a copy of Farval Spray Valve Bulletin No. 60 for a full description, with illustrative diagrams and installation data. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



WEAN pickling equipment



WEAN PICKLING LINES serve users in two important ways. Not only do they assure a better — more uniform — pickling job — but the job is done more economically and profitably.

That's why today the majority of steel makers think of Wean when it comes to sturdy, efficient, high production pickling equipment.

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